The Planning Inspectorate
Yr Arolygiaeth Gynllunio

SCOPING OPINION:

Proposed Thurrock Flexible Generation Plant

Case Reference: EN010092

Adopted by the Planning Inspectorate (on behalf of the Secretary of State for Housing, Communities and Local Government) pursuant to Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

September 2018

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1. INTRODUCTION

1.0 Background

1.0.1 On 09 August 2018, the Planning Inspectorate (the Inspectorate) on behalf of the Secretary of State (SoS) received a scoping request from Thurrock Power Ltd (the Applicant) under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for the proposed Thurrock Flexible Generation Plant (the Proposed Development).

1.0.2 In accordance with Regulation 10 of the EIA Regulations, an Applicant may ask the SoS to state in writing its opinion '*as to the scope, and level of detail, of the information to be provided in the environmental statement'.*

1.0.3 This document is the Scoping Opinion (the Opinion) provided by the Inspectorate on behalf of the SoS in respect of the Proposed Development. It is made on the basis of the information provided in the Applicant's report entitled *'EIA Scoping Report – Thurrock Flexible Generation Plant'* (the Scoping Report). This Opinion can only reflect the proposals as currently described by the Applicant. The Scoping Opinion should be read in conjunction with the Applicant's Scoping Report.

1.0.4 The Applicant has notified the SoS under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an Environmental Statement (ES) in respect of the Proposed Development. Therefore, in accordance with Regulation 6(2)(a) of the EIA Regulations, the Proposed Development is EIA development.

1.0.5 Regulation 10(9) of the EIA Regulations requires that before adopting a scoping opinion the Inspectorate must take into account:

(a) any information provided about the proposed development;

(b) the specific characteristics of the development;

(c) the likely significant effects of the development on the environment; and

(d) in the case of a subsequent application, the environmental statement submitted with the original application.

1.0.6 This Opinion has taken into account the requirements of the EIA Regulations as well as current best practice towards preparation of an ES.

1.0.7 The Inspectorate has consulted on the Applicant's Scoping Report and the responses received from the consultation bodies have been taken into account in adopting this Opinion (see Appendix 2).

1.0.8 The points addressed by the Applicant in the Scoping Report have been carefully considered and use has been made of professional judgement and experience in order to adopt this Opinion. It should be noted that

when it comes to consider the ES, the Inspectorate will take account of relevant legislation and guidelines. The Inspectorate will not be precluded from requiring additional information if it is considered necessary in connection with the ES submitted with the application for a Development Consent Order (DCO).

1.0.9 This Opinion should not be construed as implying that the Inspectorate agrees with the information or comments provided by the Applicant in their request for an opinion from the Inspectorate. In particular, comments from the Inspectorate in this Opinion are without prejudice to any later decisions taken (e.g. on submission of the application) that any development identified by the Applicant is necessarily to be treated as part of a Nationally Significant Infrastructure Project (NSIP) or Associated Development or development that does not require development consent.

1.0.10 Regulation 10(3) of the EIA Regulations states that a request for a scoping opinion must include:

(a) a plan sufficient to identify the land;

(b) a description of the proposed development, including its location and technical capacity;

(c) an explanation of the likely significant effects of the development on the environment; and

(d) such other information or representations as the person making the request may wish to provide or make.

1.0.11 The Inspectorate considers that this has been provided in the Applicant's Scoping Report. The Inspectorate is satisfied that the Scoping Report encompasses the relevant aspects identified in the EIA Regulations.

1.0.12 In accordance with Regulation 14(3)(a), where a scoping opinion has been issued in accordance with Regulation 10 an ES accompanying an application for an order granting development consent should be based on '*the most recent scoping opinion adopted (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion)*'.

1.0.13 The Inspectorate notes the potential need to carry out an assessment under The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations). This assessment must be co-ordinated with the EIA in accordance with Regulation 26 of the EIA Regulations. The Applicant's ES should therefore be co-ordinated with any assessment made under the Habitats Regulations.

1.1 The Planning Inspectorate's Consultation

1.1.1 In accordance with Regulation 10(6) of the EIA Regulations the Inspectorate has consulted the consultation bodies before adopting a scoping opinion. A list of the consultation bodies formally consulted by the Inspectorate is provided at Appendix 1. The consultation bodies have

been notified under Regulation 11(1)(a) of the duty imposed on them by Regulation 11(3) of the EIA Regulations to make information available to the Applicant relevant to the preparation of the ES. The Applicant should note that whilst the list can inform their consultation, it should not be relied upon for that purpose.

1.1.2 The list of respondents who replied within the statutory timeframe and whose comments have been taken into account in the preparation of this Opinion is provided, along with copies of their comments, at Appendix 2, to which the Applicant should refer in preparing their ES.

1.1.3 The ES submitted by the Applicant should demonstrate consideration of the points raised by the consultation bodies. It is recommended that a table is provided in the ES summarising the scoping responses from the consultation bodies and how they are, or are not, addressed in the ES.

1.1.4 Any consultation responses received after the statutory deadline for receipt of comments will not be taken into account within this Opinion. Late responses will be forwarded to the Applicant and will be made available on the Inspectorate's website. The Applicant should also give due consideration to those comments in preparing their ES.

1.2 Article 50 of the Treaty on European Union

1.2.1 On 23 June 2016, the United Kingdom (UK) held a referendum and voted to leave the European Union (EU). On 29 March 2017 the Prime Minister triggered Article 50 of the Treaty on European Union, which commenced a two year period of negotiations regarding the UK's exit from the EU. On 26 June 2018 The European Union (Withdrawal) Act 2018 received Royal Assent and work to prepare the UK statute book for Brexit has begun. The European Union (Withdrawal) Act 2018 will make sure that UK laws continue to operate following the UK's exit. There is no immediate change to legislation or policy affecting national infrastructure. Relevant EU Directives have been transposed into UK law and those are unchanged until amended by Parliament.

2. THE PROPOSED DEVELOPMENT

2.0 Introduction

2.0.1 The following is a summary of the information on the Proposed Development and its site and surroundings prepared by the Applicant and included in their Scoping Report. The information has not been verified and it has been assumed that the information provided reflects the existing knowledge of the Proposed Development and the potential receptors/ resources.

2.1 Description of the Proposed Development

2.1.1 The Applicant's description of the Proposed Development, its location and technical capacity (where relevant) is provided in Sections 2 and 3 of the Scoping Report.

2.1.2 The Proposed Development broadly comprises the construction and operation of what the Applicant describes as a *'flexible generation plant'*, on land immediately to the north of the former Tilbury B power station, within the borough of Thurrock, Essex. The Proposed Development would provide up to 600 megawatts (MW) of gas powered electrical generation capacity on a fast response basis when called by the National Grid, together with up to 150 MW of battery storage capacity. The main components of the Proposed Development are as follows:

- Up to 60 reciprocating gas engines with a total generation capacity of 600 MW;
- Batteries with output of 150 MW and storage capacity up to 600 MWh[1];
- Gas pipeline approximately 2.5km in length and above ground installation (AGI) connecting to Feeder 18 of the National Grid Transmission gas network;
- Connection to existing National Grid electricity substation, via underground cables;
- Potential cooling water pipeline to the River Thames, around 2.5km in length;
- Private access roads(s) and some widening of the public highway to facilitate delivery of large loads;

[1] i.e storing up to four hours power at maximum discharge capacity

- Designation of replacement common land and possible creation of habitat for protected species translocation; and

- Possible transfer of land to Thurrock Council for planning gain.

2.1.3 The zones within which the various development components would be located are illustrated on Figure 2 of the Scoping Report; land parcel 'A' is described as the *'main development site'*. The potential layout of the main development site (within which the gas engines, batteries and associated electrical and control infrastructure would be located) is illustrated on Figure 3 of the Scoping Report.

2.1.4 The application site is located in the south east of Thurrock, on the north side of the River Thames. The site location is illustrated on Figure 1 of the Scoping Report. The site is irregular in shape, with the main development site being comprised of predominantly flat agricultural fields, separated by drainage ditches and some man-made ponds. Overhead powerlines and a railway line cross through the application site. The application site includes an access route to the A13, extending to the north along existing roads. Part of the main development site is common land and the entire application site is located within the Thurrock Green Belt.

2.1.5 Land use to the south is generally industrial and includes the site of the former Tilbury B power station, Tilbury port and docks and a waste water recycling centre. The town of Gravesend lies to the south of the River Thames. The residential area of Tilbury lies to the west of the application site, with active and historic landfill sites located to the east. There are a number of heritage features including historic military forts and installations located in proximity to the application site including Tilbury Fort to the west, Coalhouse Fort to the east and New Tavern Fort on the south side of the Thames. The application site includes a parcel of land to the north of Tilbury Fort, which would possibly be utilised as section 106 planning gain land.

2.1.6 The proposed gas pipeline connection would cross through agricultural land to Feeder 18, located to the north east of the main development site. The application site currently includes two route options for the gas pipeline after Station Road (see Figure 2 of the Scoping Report).

2.1.7 The Proposed Development includes a potential cooling water pipeline into the River Thames, which flows out into the Thames Estuary. The Thames Estuary and surrounding areas are covered by numerous ecological designations including the South Thames Estuary and Marshes Site of Special Scientific Interest (SSSI) and the Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar site. The application site is located within Flood Zone 3.

2.2 The Planning Inspectorate's Comments

Description of the Proposed Development

2.2.1 The ES should include the following:

- a description of the Proposed Development comprising at least the information on the site, design, size and other relevant features of the development; and
- a description of the location of the development and description of the physical characteristics of the whole development, including any requisite demolition works and the land-use requirements during construction and operation phases.

2.2.2 Table 3.2 of the Scoping Report sets out an *'outline development envelope'* for the purposes of seeking a Scoping Opinion, but it is indicated that this would be refined where possible. The Inspectorate understands that at this point in the evolution of the Proposed Development, a final description of the development is not yet confirmed. However, the Applicant should be aware that the description of the Proposed Development provided in the ES must be sufficiently certain to meet the requirements of the EIA Regulations. The ES must include a description of the Proposed Development and make reference to the design, size and locations of each element, including maximum heights, design parameters and limits of deviation. The description should be supported (as necessary) by figures, cross sections and drawings which should be clearly and appropriately referenced.

2.2.3 The Scoping Report identifies available options for the principal components of the Proposed Development. The options include those in relation to the gas pipeline route, access to the site via road/water and gas engine cooling (which may be via air cooling or a cooling water pipeline to the River Thames). The Scoping Report suggests a number of different approaches relevant to the cooling water pipeline (if this option is pursued) including whether this would form part of the DCO application or be subject to a separate application under the Town and Country Planning Act 1990. There is also some uncertainty as to the precise locations of the intake and outfall pipes. The Inspectorate notes that early determination of options will support a more robust assessment of likely significant effects and provide certainty to those likely to be affected. The description of the Proposed Development and the assessment of significant effects should include all design characteristics and parameters applicable to the entire development. The ES should also explain the anticipated routes for consenting for any elements of the Proposed Development that do not form part of the DCO application.

2.2.4 Construction of the Proposed Development is anticipated to take around 12 months, with a high level overview of the construction programme provided in paragraph 3.40 of the Scoping Report. This description should be developed in the ES to include details of how the construction would

be phased, including the likely commencement date, duration and location of the required construction activities.

2.2.5 The ES should provide details of the anticipated construction working hours (including any night time working required) and activities on which the assessments of likely significant effect have been based. This should be consistent with the working hours specified in the draft DCO (dDCO).

2.2.6 Paragraph 1.7 of the Scoping Report explains that the placement of construction compounds within the application site has not been identified at this stage. To ensure a robust assessment of likely significant effects, the Inspectorate advises that the location and size of the construction compounds is confirmed in the ES.

2.2.7 The Scoping Report identifies a number of existing infrastructure assets within in or in proximity to the application site, including overhead lines and a railway line. The Scoping Report explains the Applicant's intent to avoid direct impacts to these assets where possible but acknowledges that there may well be occasions (particularly during construction) where interactions occur e.g. the need to lift equipment across the railway (paragraph 3.34 of the Scoping Report). The assessment in the ES should take into account the locations of existing infrastructure and identify any interactions between it and the Proposed Development. Any significant effects that are likely to occur should be assessed. In particular, the Applicant's attention is drawn to the scoping consultation response from National Grid Electricity Transmission Plc (Appendix 2 of this Opinion), which highlights electricity transmission infrastructure that could be affected by the Proposed Development (the overhead line which crosses the site).

2.2.8 For the purposes of the Scoping Report, the Proposed Development is described as including '*up to 60* [gas engine] *stacks, each up to 40m high'* (Table 3.2 of the Scoping Report). Paragraph 3.16 of the Scoping Report further explains that there '*….may be individual stacks for each engine or aggregated into fewer stacks'*. To ensure a robust assessment of likely significant effects, the ES should confirm the maximum number, height and diameter of the stacks. It should be clear what assumptions have been made in relevant ES assessments regarding the placement of stacks particularly with regards to air quality modelling and the Landscape and Visual Impact Assessment.

2.2.9 Paragraph 9.19 of the Scoping Report states that *'Security lighting for the main development site may be required'.* This position should be confirmed as part of the description of the Proposed Development in the ES. The ES should describe the lighting requirements for all elements and phases of the Proposed Development. It should be explained what measures are proposed to minimise light spill into the surrounding area.

2.2.10 The Scoping Report presents little information in relation to proposed works in the marine environment. If the cooling water pipeline option is pursued, the ES should describe in detail all proposed works in the

marine environment. If construction and maintenance dredging is required, the ES should identify the areas that would be dredged and the likely quantities of material that would be dredged, along with the methods and frequencies of these activities. Any likely significant effects should be assessed.

2.2.11 The ES should describe the location and methods applied for piling activities, including any piling in the marine area. Any likely significant effects should be assessed and any proposed mitigation measures described.

2.2.12 Paragraph 3.17 of the Scoping Report states that *'The maximum operating time of the gas engines per year could be up to 2,750 hours, subject to agreement with the Environment Agency'.* The ES should clearly state the maximum operating time of the gas engines which has been assumed for the purposes of the assessment. If this cannot be confirmed until a later stage, a worst case should be identified and assessed.

2.2.13 Information regarding anticipated maintenance activities should be provided in the ES (including duration, frequency, anticipated numbers of workers and traffic movements) and any likely significant effects assessed. If the cooling water pipeline is pursued, this should include the need for (and impacts from) access and maintenance works during operation of the pipeline.

2.2.14 The process and methods of decommissioning should be considered and options presented in the ES. Where significant effects are likely to occur as a result of decommissioning the Proposed Development, these should be described and assessed in the ES. Paragraph 3.45 of the Scoping Report states: *'The decision on how much of the below ground infrastructure would be retained would be agreed with the landowner and any other interested parties, accounting for decommissioning methods and timescales at the time'.* The ES should explain how these uncertainties have been taken into account in the assessment of impacts from decommissioning the Proposed Development.

2.2.15 In addition to the above, the ES should also include a description of the anticipated:

- numbers of construction workers;
- types of construction plant and machinery;
- number, type, movements and parking of construction vehicles;
- number, type and movement of any construction materials/loads via barge; and
- nature and quantity of materials and natural resources used.

Alternatives

2.2.16 The EIA Regulations require that the Applicant provide *'A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'.*

2.2.17 The Inspectorate acknowledges the Applicant's intention to consider alternatives within the ES. The Inspectorate would expect to see a discrete section in the ES that provides details of the reasonable alternatives studied and the reasoning for the selection of the chosen option(s), including a comparison of the environmental effects. This should include any reasonable transport options which have been considered (such as delivery of abnormal loads and construction materials via nearby ports/ jetties and rail).

2.2.18 The Scoping Report explains that sequential site search, need for development of this type (supported by national policy) and assessment of Best Available Technology have shown that the proposed site and technology are the best option. The Scoping Report proposes to scope out alternative sites and technologies from consideration in the ES (Table 7.2 of the Scoping Report). However, paragraph 5.24 of the Scoping Report presents a commitment to provide a more detailed description of other site locations considered in the ES. The Planning Inspectorate agrees that a more detailed description of the alternative sites considered in the sequential site search exercise should be included in the ES, as well as a description of the reasonable alternative technologies considered.

Flexibility

2.2.19 The Inspectorate notes the Applicant's desire to address uncertainty by incorporating flexibility into the dDCO and its intention to apply a Rochdale Envelope approach for this purpose. As discussed above, Table 3.2 of the Scoping Report sets out an '*outline development envelope'* which would be refined where possible. Where uncertainty exists and flexibility is sought, the ES should clearly set out the design characteristics and parameters that would apply, and how these inform the assessment in the ES. Where the details of the Proposed Development cannot be defined precisely, the Applicant should apply a worst case scenario relative to each aspect chapter, as acknowledged in Table 3.3 of the Scoping Report.

2.2.20 The Applicant's attention is drawn to the Inspectorate's Advice Note Nine 'Using the 'Rochdale Envelope'[2], which provides details on the recommended approach to follow when incorporating flexibility into a dDCO.

2.2.21 The Applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The development parameters will need to be clearly defined in the dDCO and in the accompanying ES. It is a matter for the Applicant, in preparing an ES, to consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations.

2.2.22 It should be noted that if the Proposed Development materially changes prior to submission of the DCO application, the Applicant may wish to consider requesting a new scoping opinion.

[2] Advice Note Nine: Using the Rochdale Envelope. 2018. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

3. ES APPROACH

3.1 Introduction

3.1.1 This section contains the Inspectorate's specific comments on the scope and level of detail of information to be provided in the Applicant's ES. General advice on the presentation of an ES is provided in the Inspectorate's Advice Note Seven 'Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements'[3] and associated appendices.

3.1.2 Aspects/ matters (as defined in Advice Note Seven) are not scoped out unless specifically addressed and justified by the Applicant, and confirmed as being scoped out by the Inspectorate. The ES should be based on the Scoping Opinion in so far as the Proposed Development remains materially the same as the Proposed Development described in the Applicant's Scoping Report.

3.1.3 The Inspectorate has set out in this Opinion where it has/ has not agreed to scope out certain aspects/ matters on the basis of the information available at this time. The Inspectorate is content that the receipt of a Scoping Opinion should not prevent the Applicant from subsequently agreeing with the relevant consultees to scope such aspects/ matters out of the ES, where further evidence has been provided to justify this approach. However, in order to demonstrate that the aspects/ matters have been appropriately addressed, the ES should explain the reasoning for scoping them out and justify the approach taken.

3.1.4 Where relevant, the ES should provide reference to how the delivery of measures proposed to prevent/ minimise adverse effects is secured through DCO requirements (or other suitably robust methods) and whether relevant consultees agree on the adequacy of the measures proposed.

3.2 Relevant National Policy Statements (NPSs)

3.2.1 Sector-specific NPSs are produced by the relevant Government Departments and set out national policy for NSIPs. They provide the framework within which the Examining Authority (ExA) will make their recommendation to the SoS and include the Government's objectives for the development of NSIPs. The NPSs may include environmental requirements for NSIPs, which Applicants should address within their ES.

[3] Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements and annex. Available from: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

3.2.2 The Scoping Report states that the designated NPSs relevant to the Proposed Development are the:

- Overarching NPS for Energy (NPS EN-1);
- NPS for Fossil Fuel Electricity Generating Infrastructure (NPS EN-2);
- NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4); and
- NPS for Electricity Networks Infrastructure (NPS EN-5).

3.3 Scope of Assessment

General

3.3.1 The Inspectorate recommends that in order to assist the decision-making process, the Applicant uses tables:

- to demonstrate how the assessment has taken account of this Opinion;
- to identify and collate the residual effects after mitigation for each of the aspect chapters, including the relevant interrelationships and cumulative effects;
- to set out the proposed mitigation and/ or monitoring measures including cross-reference to the means of securing such measures (e.g. a dDCO requirement);
- to describe any remedial measures that are identified as being necessary following monitoring; and
- to identify where details are contained in the Habitats Regulations Assessment (HRA report) (where relevant), such as descriptions of European sites and their locations, together with any mitigation or compensation measures, are to be found in the ES.

3.3.2 The Inspectorate recommends that the physical scope of the study areas should be identified under all the environmental aspects of the ES and should be sufficiently robust in order to undertake the assessment. The ES should justify the extent of the study areas on the basis of recognised professional guidance (whenever such guidance is available) and the extent of the likely impacts, with reference to relevant models or approaches such as traffic modelling or Zones of Theoretical Visibility (ZTV). The study areas should also be agreed with the relevant consultation bodies and where this is not possible, this should be stated clearly in the ES and reasoned justification given. The scope should also cover the breadth of the topic area and the temporal scope, and these aspects should be described and justified.

3.3.3 The description of the sensitive receptors and the potential impacts in the Scoping Report is generally focused on the main development site. The ES should identify sensitive receptors and assess impacts which are likely to result in significant effects in relation to the entirety of the Proposed Development including elements beyond the main development site.

3.3.4 The ES should justify the choice of receptor locations with reference to the extent of the likely impacts and seek to agree these with the relevant consultation bodies. The aspect chapters should explain how the sensitivity of receptors and the magnitude of the impact have been determined.

3.3.5 The scale of development proposed in the Tilbury area requires detailed consideration of both temporary and permanent cumulative effects. As such, the Inspectorate recommends that the cumulative effects assessment is presented in a standalone aspect chapter. The Inspectorate has provided further comments regarding the proposed approach to assessing cumulative effects in Table 4.21 of this Opinion.

Baseline Scenario

3.3.6 The ES should include a description of the baseline scenario with and without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

3.3.7 The description of the baseline conditions in the Scoping Report is generally focused on the main development site. The ES should describe the baseline conditions across the entirety of the application site.

3.3.8 In light of the number of ongoing developments within the vicinity of the Proposed Development application site, the ES should clearly state which developments will be assumed to be under construction or operational as part of the future baseline. The ES should set out what assumptions have been made regarding the likely stages of construction/ operation applicable to Tilbury2, the Lower Thames Crossing, Tilbury Energy Centre and the other developments identified.

Forecasting Methods or Evidence

3.3.9 The ES should contain the timescales upon which the surveys which underpin the technical assessments have been based. For clarity, this information should be provided either in the introductory chapters of the ES (with confirmation that these timescales apply to all chapters), or in each aspect chapter.

3.3.10 The Inspectorate expects the ES to include a chapter setting out the overarching methodology for the assessment, which clearly distinguishes effects that are 'significant' from 'non-significant' effects. Any departure from that methodology should be described in individual aspect assessment chapters.

3.3.11 The ES should include details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

Residues and Emissions

3.3.12 The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases, where relevant. This information should be provided in a clear and consistent fashion and may be integrated into the relevant aspect assessments.

Mitigation

3.3.13 Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should also address how any mitigation proposed is secured, with reference to specific DCO requirements or other legally binding agreements.

3.3.14 The Inspectorate notes that various management plans/ strategies are to be produced, including a Code of Construction Practice (CoCP) and a Construction Environmental Management Plan (CEMP). The Applicant should append a draft copy/ outline of these documents to the ES and/ or demonstrate how they will be secured. Where the ES relies upon mitigation measures which would be secured through a management plan/ strategy, it should be demonstrated (with clear cross-referencing) where each measure is set out in the draft/ outline document.

Risks of Major Accidents and/ or Disasters

3.3.15 The ES should include a description and assessment (where relevant) of the likely significant effects resulting from major accidents and disasters applicable to the Proposed Development. The Applicant should make use of appropriate guidance (e.g. that referenced in the Health and Safety Executive's (HSE) Annex to Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards.

3.3.16 The description and assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster and also the Proposed Development's potential to cause an accident or disaster. The assessment should specifically assess significant effects resulting from the risks to human health, cultural heritage or the environment. Any measures that will be employed to prevent and control significant effects should be presented in the ES.

3.3.17 Relevant information available and obtained through risk assessments pursuant to European Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this

description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

3.3.18 The Inspectorate has provided comments regarding the proposed approach to assessing major accidents and disasters in Table 4.12 of this Opinion.

Climate and Climate Change

3.3.19 The ES should include a description and assessment (where relevant) of the likely significant effects the Proposed Development has on climate (for example having regard to the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change. Where relevant, the ES should describe and assess the adaptive capacity that has been incorporated into the design of the Proposed Development. This may include, for example, alternative measures such as changes in the use of materials or construction and design techniques that will be more resilient to risks from climate change.

3.3.20 The Inspectorate has provided comments regarding the proposed approach to assessing impacts on and due to climate change in Table 4.11 of this Opinion.

Transboundary Effects

3.3.21 Schedule 4 Part 5 of the EIA Regulations requires a description of the likely significant transboundary effects to be provided in an ES.

3.3.22 The Scoping Report concludes that the Proposed Development is not likely to have significant effects on another European Economic Area (EEA) State and proposes that transboundary effects do not need to be considered within the ES. The Inspectorate notes the Applicant's conclusion in the Scoping Report; however recommends that, for the avoidance of doubt, the ES details and justifies this conclusion.

A Reference List

3.3.23 A reference list detailing the sources used for the descriptions and assessments must be included in the ES.

3.4 Confidential Information

3.4.1 In some circumstances it will be appropriate for information to be kept confidential. In particular, this may relate to information about the presence and locations of rare or sensitive species such as badgers, rare birds and plants where disturbance, damage, persecution or commercial exploitation may result from publication of the information. Where documents are intended to remain confidential the Applicant should provide these as separate paper and electronic documents with their confidential nature clearly indicated in the title, and watermarked as such on each page. The information should not be incorporated within other

documents that are intended for publication or which the Inspectorate would be required to disclose under the Environmental Information Regulations 2014.

4. ASPECT BASED SCOPING TABLES

4.1 Landscape and Visual Resources

(Scoping Report paragraphs 8.2 – 8.22)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.1.1	n/a	n/a	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Other points	Inspectorate's comments
4.1.2	Table 3.2	Assessment	The ES should clearly explain any assumptions made in the landscape and visual assessment regarding the number, height, diameter and placement of the stacks.
4.1.3	Paragraphs 8.13 and 3.23	Mitigation	The Scoping Report indicates that screen planting may be provided as a means of mitigating the impacts on landscape and visual receptors (paragraph 3.23). The ES should clearly describe the proposed landscaping, and demonstrate how this relates to other nearby landscaping proposals (e.g. Tilbury2, Tilbury Energy Centre and the Lower Thames Crossing) where such detail is known. It should be clear how the landscape and effects are expected to alter as proposed planting matures. Any interactions with other ES aspects, for example impacts on local ecology, should be explained. The Applicant should discuss and make effort to agree the planting specification/ species mix with relevant consultation bodies.
4.1.4	Paragraphs 8.15 to 8.17	Receptors	The ES should assess impacts to residential receptors where significant effects are likely to occur. The ES should identify any guidance documents used to inform the assessment of impacts to residential amenity.

ID	Ref	Other points	Inspectorate's comments
4.1.5	Paragraph 8.16	Night time impacts	The Scoping Report explains that an assessment of night time effects on landscape and visual receptors will be undertaken; the Inspectorate advises that this should include impacts from lighting. The Applicant's attention is drawn to the Inspectorate's comments in Table 4.17, ID 4.17.22 of this Opinion.
4.1.6	Paragraph 8.17	Cumulative impacts	The ES should clearly explain the baseline year used to inform the cumulative landscape and visual assessment. The ES should set out any assumptions made regarding the likely stages of construction/ operation applicable to Tilbury2, the Lower Thames Crossing, Tilbury Energy Centre and the other developments identified.
4.1.7	Paragraphs 8.18 to 18.20; Figure 9	Viewpoints and photomontages	Twenty potential viewpoints are identified (paragraph 8.19 and Figure 9 of the Scoping Report). It is proposed that the exact location of viewpoints and photomontages are agreed with Thurrock District Council (and Natural England in respect of the Kent Downs AONB). For the assessment of cumulative impacts, the Applicant should consider the viewpoints selected for other developments in the area including Tilbury2, Tilbury Energy Centre and Lower Thames Crossing. Having regard to the characteristics of the Proposed Development and the range of likely effects, the Inspectorate advises that neighbouring planning authorities including Gravesham Council are also consulted and effort is made to agree representative viewpoints/ photomontages. Both summer and winter views should be included.
4.1.8	n/a	Receptors	Impacts (including cumulative impacts with other developments) likely to result in significant effects on the visual amenity of users of the River Thames should be assessed in the ES. This is likely to be of most relevance if the cooling water option is pursued.
4.1.9	n/a	Impacts - construction	The ES should assess impacts with the potential to result in likely significant effects on landscape and visual receptors resulting from use

ID	Ref	Other points	Inspectorate's comments
			of the construction compounds and use of any temporary structures/ features required for construction (such as material/ soil stockpiles and cranes).
4.1.10	n/a	Design	The ES should explain how the siting and design of the proposed structures (and the materials to be used) have been selected with the aim of minimising impacts to landscape and visual receptors.

4.2 Archaeology and Cultural Heritage

(Scoping Report paragraphs 8.23 – 8.40)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.2.1	n/a	n/a	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Other points	Inspectorate's comments
4.2.2	Paragraph 8.23	Receptors	Paragraph 8.23 of the Scoping Report identifies the principal heritage assets which may be impacted by the Proposed Development. In addition to these, the Inspectorate considers that the ES should assess any likely significant effects on the settings of heritage assets on the southern side of the Thames, including Cliffe, Shornemead and New Tavern Forts. The assessment should consider the potential for cumulative impacts on cultural heritage assets, particularly in terms of the impacts to the settings of the military forts and the loss of archaeological resource. The cumulative assessment should include Tilbury2, Tilbury Energy Centre and the Lower Thames Crossing. Other projects to be considered in the cumulative assessment should be discussed and agreed with the relevant consultation bodies.
4.2.3	Paragraph 8.24	Impacts	Whilst no Conservation Areas have been identified within the application site boundary, the Inspectorate notes that the proposed access route is located immediately adjacent to the West Tilbury Conservation Area. Any likely significant effects on the setting of the Conservation Area (particularly in terms of impacts from noise and traffic) should be assessed in the ES.
4.2.4	Paragraphs	Geophysical survey; intrusive	The Inspectorate notes that that the geophysical survey undertaken in

ID	Ref	Other points	Inspectorate's comments
	8.25 and 8.26	investigations	2017 and provided in Appendix B of the Scoping Report does not extend to the entirety of the Proposed Development area. The Applicant should ensure that the information used to inform the assessment is robust and allows suitable identification of assets likely to be impacted by the Proposed Development. The Applicant should make effort to agree the need for intrusive investigations (paragraph 8.26 of the Scoping Report indicates that intrusive investigations may be carried out) with relevant consultation bodies. Where necessary intrusive investigations should be completed prior to submission of the DCO application. The Applicant should ensure that their approach to defining the archaeological baseline is sufficient to identify potential archaeological remains within alluvial deposits.
4.2.5	Paragraphs 8.28 and 8.30	Impacts to terrestrial and marine archaeology	The Inspectorate notes the potential for impacts to buried archaeology, as well as impacts to marine archaeological remains if the water cooling pipeline option is pursued. Cumulative impacts with other developments should also be assessed. The ES should set out the proposals for the recording of archaeology which would be permanently lost as a result of the Proposed Development and make effort to agree the approach with relevant consultation bodies. The ES assessment of impacts to buried archaeology should take into account the guidance contained in Historic England's guidance document 'Preserving Archaeological Remains'[4].

[4] Preserving Archaeological Remains: Decision taking for sites under development (Historic England, 2016)

ID	Ref	Other points	Inspectorate's comments
4.2.6	Paragraphs 8.29 to 8.31	Impacts to setting	The Inspectorate notes (paragraph 8.31 of the Scoping Report) that the assessment of impacts to setting will follow the staged approach set out in Historic England's 'The Setting of Heritage Assets: Good Practice Advice in Planning Note 3'[5]. Appropriate viewpoints and photomontages should be used to illustrate how the Proposed Development would be seen in views from key heritage assets, both alone and together with other developments including Tilbury2, Tilbury Energy Centre and the Lower Thames Crossing. The Applicant should make effort to discuss and agree the location of viewpoints and the need for photomontages with relevant consultation bodies including Historic England.
4.2.7	Paragraph 8.34	Methodology	Paragraph 8.34 of the Scoping Report describes how it is proposed to determine significance of effect, using a matrix-based approach. The ES should ensure that the methodology used is applicable to address the context of the receiving environment and issues relevant to the Proposed Development. Where professional judgement is used to reach conclusions on levels of harm and significance of effect this should be explained. The Inspectorate notes Historic England's comments in this regard (see section 3.4 of their scoping consultation response, Appendix 2 of this Opinion) and advises the Applicant to make effort to agree a specific methodology with relevant consultation bodies.

[5] The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (Second Edition) (Historic England, 2017)

4.3 Traffic and Transport

(Scoping Report paragraphs 8.41 – 8.53)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.3.1	Paragraphs 8.47 and 8.53	Assessment of operational traffic generation	The Scoping Report explains (paragraph 8.47) that the operational phase of the Proposed Development would require occasional staff and maintenance visits. Paragraph 9.10 of the Scoping Report further explains that the Proposed Development would largely be operated remotely and there would be no permanent staff present on a day-to-day basis. The Inspectorate has had regard to the characteristics of the Proposed Development and considers that significant effects from operational traffic from the Proposed Development alone are unlikely to occur. The Inspectorate therefore agrees that this matter can be scoped out of the ES. However the ES should address cumulative impacts from traffic during operation of the Proposed Development together with traffic from other developments (including Tilbury2, Tilbury Energy Centre and the Lower Thames Crossing) where significant effects are likely.

ID	Ref	Other points	Inspectorate's comments
4.3.2	n/a	Study area	The Scoping Report does not define the proposed study area; however, paragraph 8.50 explains the intent to agree the study area with the local planning authorities and Highways England. The ES should clearly define the study area used for the assessment and explain the approach taken to do so which should be influenced by the extent of likely impacts. The ES should include a plan to depict the study area.

ID	Ref	Other points	Inspectorate's comments
4.3.3	Paragraphs 2.12 and 8.43	Impacts to users of Public Rights of Way (PRoW)	Paragraph 2.12 of the Scoping Report confirms that there are no PRoW within the main development site, but it is not clear whether any other parts of the Proposed Development would interfere with PRoW. This should be confirmed in the ES, including whether any temporary diversions of PRoW are required. The ES should assess impacts to users of PRoW where likely significant effects may occur. The assessment of impacts on PRoW users should consider potential interactions with other aspect assessments as relevant (for example noise, dust, recreation and visual impact).
4.3.4	Paragraph 8.44	Impacts	The ES should assess impacts that may result in likely significant effects on the safety, reliability and operation of the Strategic Road Network, including the M25 (particularly Junction 30), the A13 and the A1039.The assessment methodology and any necessary mitigation measures should be discussed and effort made to agree the approach with relevant consultation bodies including Highways England.
4.3.5	Paragraph 8.48	Transport Assessment (TA)	The Applicant proposes to undertake a TA in respect to construction traffic impacts. The Applicant should have regard to the comments above regarding the need to address cumulative impacts during operation when determining the scope of the TA. The ES should clearly explain the relationship with the TA, how traffic movements have been predicted and what models and assumptions have been used to inform the assessment. Anticipated numbers of vehicle movements should be set out (including vehicle type, peak hour and daily movements). The Traffic and Transport and Cumulative Effects aspect chapters should clearly explain the approach adopted to

ID	Ref	Other points	Inspectorate's comments
			estimate traffic growth as it appears in the TA. The explanation should include reference to appropriate software such as the Department for Transport's TEMPRO[6] software. This should be kept under review should any other development come forward which may trigger the need to update the previous traffic modelling work. The Applicant should make effort to agree the scope of the TA with relevant consultation bodies including highway authorities and Highways England.
4.3.6	Paragraphs 8.49 and 8.50	Sensitive receptors	The Scoping Report does not identify specific sensitive receptors for the purposes of the assessment, although paragraph 8.50 does confirm that users of PRoW will be considered. The Scoping Report states that the ES assessment will utilise criteria within the *Guidelines for the Environmental Assessment of Road Traffic*'[7] (IEMA, 1993) to determine magnitude of impact and significance of effect. The Applicant is advised to consider section 2.5 of these guidelines when identifying receptors which are sensitive to changes in traffic conditions. The Inspectorate advises that these should include nature conservation sites, residential receptors and non-motorised road users where significant effects are likely to occur.
4.3.7	Paragraph 8.50	Mitigation	Paragraph 8.50 of the Scoping Report indicates that a Construction Worker Travel Plan and Construction Traffic Management Plan are to be provided. Draft/ outline versions of these documents can be appended to the ES and the ES should demonstrate how adherence with the measures in these documents will be secured.

[6] Trip End Model Presentation Program (TEMPRO)

[7] Guidelines for the Environmental Assessment of Road Traffic: Institute of Environmental Management (IEMA) (1993)

ID	Ref	Other points	Inspectorate's comments
4.3.8	Paragraph 8.50	Abnormal loads	The ES should confirm the anticipated number of abnormal loads (including any to be delivered via ship/ barge) and the types of vehicles required. Any mitigation measures required to facilitate the delivery of abnormal loads should be detailed in the ES and any resultant likely significant effects assessed.
4.3.9	Paragraph 8.52	Traffic count surveys	The ES should explain and justify the locations for the traffic count surveys. The locations should be shown on a supporting plan included within the ES or supporting appendices.
4.3.10	Paragraph 8.123; Figure 2	Access routes	Proposed access routes are shown on Figure 2, however these are not clearly marked and this prevents the reader from precisely identifying where access routes will be, including access for HGVs. The ES should clearly describe the routes to be used for all vehicular access during construction and operation of the Proposed Development and this information should be clearly on supporting plans contained within the ES. For the assessment of impacts during construction the ES should explain how the proposed access route(s) relate to sensitive receptors (see above).
4.3.11	n/a	Impacts	The Traffic and Transport chapter of the ES should include an assessment of impacts resulting from transportation of construction materials/ abnormal loads to the site via water, if this option is pursued. This should include an assessment of any impacts to navigation (e.g. lighting) which are likely to result in significant effects. Impacts from the Proposed Development alone and cumulatively with other developments should be considered. The assessment methodology and any necessary mitigation measures should be discussed and effort made to agree them with relevant consultation bodies.
4.3.12	n/a	Impacts	The ES should clearly explain the relationship between the traffic modelling and the assessment of other relevant aspects, in particular

ID	Ref	Other points	Inspectorate's comments
			the air quality, noise and vibration assessments. The Applicant should ensure appropriate cross referencing between the relevant ES aspect chapters.
4.3.13	n/a	Decommissioning	It is unclear whether an assessment of impacts during decommissioning is proposed. The ES should set out the likely impacts on Traffic and Transport resulting from decommissioning of the Proposed Development in respect to Traffic and Transport. Any likely significant effects should be assessed.

4.4 Land Use, Agriculture and Socio Economics

(Scoping Report paragraphs 8.54 – 8.63)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.4.1	Paragraph 8.63	A detailed assessment of socio economic impacts of employment generation	The Scoping Report suggests that the characteristics of the Proposed Development are such that a detailed assessment relating to socio economic impacts of employment generation should be scoped out from consideration in the ES. The Scoping Report states that the impacts would most likely be temporary and connected to the construction workforce. The Inspectorate has had regard to the characteristics of the development and the extent of likely impacts. The Inspectorate agrees that on the basis of the information contained in the Scoping Report, the impacts from the Proposed Development are likely to be temporary. The Applicant should ensure that the assessment in the ES is sufficient to identify any likely significant effects but the Inspectorate considers that a 'proportionate' assessment using qualitative methods and professional judgement can be appropriate in this regard. The Inspectorate is also aware of a number of other proposed developments in proximity to the Proposed Development which have potential to be constructed over a similar timescale. There is potential for significant cumulative socio economic effects from multiple large scale construction activities taking place within a relatively small area. The Inspectorate considers that the cumulative assessment of socio economic impacts should be appropriately focussed towards the construction phases of the Proposed Development and other relevant developments.

ID	Ref	Other points	Inspectorate's comments
4.4.2	Paragraph 8.57	Employment generation	The assessment should provide a breakdown of the likely jobs and roles created during each phase of the Proposed Development. Any proposed measures such as skills and training programmes or apprenticeships that would promote local employment should be discussed and effort made to agree them with relevant consultation bodies.
4.4.3	Paragraph 8.57	Impacts	The Inspectorate notes the intention to assess impacts resulting from the permanent loss of agricultural land. The ES should quantify the agricultural land which would be temporarily and permanently lost as a result of construction and operation of the Proposed Development (by Agricultural Land Classification (ALC) grade) and assess any impacts that may result in likely significant effects. Any impacts likely to result in significant effects on soil quality should also be described and assessed. The ES assessment of impacts to agricultural land should be undertaken with reference to appropriate guidance such as the Ministry of Agriculture, Fisheries and Food (MAFF) guidelines[8] and Natural England's TIN049[9].
4.4.4	Paragraphs 8.57 and 3.37	Impacts	The Scoping Report explains that the Proposed Development (as envisaged) will result in the loss of Common Land and replacement land will be necessary. The Applicant should make effort to agree the replacement land provision with relevant consultation bodies notably Natural England. The ES should explain the extent to which the replacement land is of equivalent value to that being lost. The ES

[88] Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988)

[9] Natural England Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile agricultural land (2012)

ID	Ref	Other points	Inspectorate's comments
			should provide details of how the replacement land would be managed and assess inter-related impacts (such as impacts on landscape and ecological receptors). Cross-reference should be made to the relevant ES aspect chapters.
4.4.5	n/a	Potential for impacts on tourism and recreation	It is not clear whether potential impacts on tourism and recreation would be assessed in the ES. Along with users of PRoW, any impacts likely to result in significant effects on the users of other types of recreational and tourism receptors in the surrounding area should be assessed including for example, nature reserves and visitors to the Tilbury and Coalhouse Forts. Cumulative impacts with other developments should be assessed where significant effects are likely to occur.
4.4.6	n/a	Study areas	The ES should clearly describe the study areas relevant to the anticipated impacts to land use, agriculture and socio economic receptors. The ES should include a clear justification in support of the study areas and ensure they are depicted on corresponding figures to aid understanding. It should be clear how the selected study areas relate to the extent of the likely impacts.
4.4.7	Paragraph 8.57	Potential impacts	Any potential impacts on local businesses/ commercial operations (for example, any impacts arising from road or footpath closures) should be described and assessed within the ES where significant effects are likely to occur. This should include the Port of Tilbury and if the water cooling pipeline option is taken forward, other commercial users of the river. Any cumulative impacts on local businesses/ commercial operations which are likely to result in significant effects should also be assessed.

4.5 Air Quality

(Scoping Report paragraphs 8.64 – 8.84)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.5.1	Paragraph 8.84	Air pollutant emissions from operational traffic	The Scoping Report proposes to scope out an assessment of emissions to air from operational traffic, describing traffic generated during operation of the Proposed Development as *'negligible'.* The Inspectorate is content that due to the nature and characteristics of the Proposed Development, significant effects from operational traffic are unlikely to occur. The Inspectorate is content that an assessment of air pollutant emissions from operational traffic from the Proposed Development alone can be scoped out of the ES. However the ES should address cumulative impacts from operational traffic emissions from the Proposed Development together with other developments (including Tilbury2, Tilbury Energy Centre and the Lower Thames Crossing).
4.5.2	Paragraph 8.84	Air pollutant emissions from construction traffic (if predicted construction traffic is below assessment thresholds)	The Applicant considers that an assessment of air pollution emissions from construction traffic can be scoped out, providing traffic flows are predicted to be below the indicative thresholds for assessment set out in Environmental Protection UK (EPUK)/ Institute of Air Quality Management (IAQM) guidance[10]. At this stage, the Applicant expects that construction traffic flows are likely to be below the indicative thresholds in the EPUK/ IAQM guidance, but does not provide specific details of the likely traffic flows.

[10] EPUK/IAQM (2017) Land Use Planning and Development Control: Planning for Air Quality

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			In the absence of specific information regarding the anticipated numbers of construction traffic movements and noting the potential for cumulative impacts with other proposed developments (including potential impacts to Air Quality Management Areas (AQMAs)), the Inspectorate is not in a position to agree to scope out this matter from consideration in the ES. The ES should therefore assess any likely significant effects resulting from air pollutant emissions from construction traffic, both alone and cumulatively with other proposed developments. It should be clear how the outcomes of the traffic modelling have informed this assessment. If the option to transport construction materials/ abnormal loads via water is pursued, the ES should assess the associated impacts where significant effects are likely.

ID	Ref	Other points	Inspectorate's comments
4.5.3	Paragraph 8.64	Assessment –AQMAs	A number of AQMAs are identified in proximity to the Proposed Development, the extent of which should be illustrated on plans within the ES. If there is any potential to affect air quality within the AQMAs and the delivery of their action plans then this should be assessed.
4.5.4	Paragraph 8.67	Baseline	The Scoping Report explains that baseline nitrogen dioxide (NO_2) concentrations have been measured at five locations around the application site, using passive diffusion tubes (as detailed in Appendix G of the Scoping Report). The Applicant should discuss and agree with relevant consultation bodies whether diffusion tube monitoring (supplemented by local authority NO_2 monitoring data and Defra mapped NO_2 concentrations) is sufficient to inform a robust assessment. The ES should fully justify the approach taken.

ID	Ref	Other points	Inspectorate's comments
			The ES should include details of the monitoring locations, the monitoring method, sampling period, data capture and any adjustments applied to the data, such as diffusion tube bias adjustment factors.
4.5.5	Paragraph 8.71	Assessment – construction (dust)	The Applicant proposes to undertaken an assessment of impacts from construction dust. The ES should explain which construction activities are likely to generate dust and assess the impacts which are likely to result in significant effects on sensitive human and ecological receptors. This should include consideration of any cumulative impacts with other proposed developments. The study area relevant to the construction dust assessment should be defined and justified in the ES, with reference to the IAQM guidance[11] and the extent of the likely impacts.
4.5.6	Paragraph 8.74	Impacts	Paragraph 8.74 of the Scoping Report explains that the main pollutant emitted during operation of the Proposed Development (via the exhaust stacks) would be nitrogen oxides (NO_X). In addition to NO_x, the ES should model and assess any likely significant effects resulting from increased deposition of nitrogen, acid and ammonia.
4.5.7	Paragraph 8.76	Assessment – stacks	Paragraph 8.76 of the Scoping Report explains that a stack height assessment will be undertaken to establish an *'appropriate height'* for the stacks. The Inspectorate advises that a similar assessment is undertaken in relation to stack diameter. A description of the methods used for determining the stack height and diameter should be included

[11] IAQM (2016) Guidance on the assessment of dust from demolition and construction

ID	Ref	Other points	Inspectorate's comments
			within the ES, including any sensitivity testing which has been undertaken. The ES should clearly explain the assumptions that have been made in the air quality assessment regarding the number, placement, height and diameter of the stacks and the Applicant should ensure these parameters are reflected in the dDCO.
4.5.8	Paragraphs 8.77 and 8.78	Sensitive receptors	Receptors for the purposes of the air quality assessment are described as '*selected sensitive human-health receptors'* and *'statutorily designated habitat sites',* but no specific locations are proposed. The ES should describe and clearly identify the selected receptors, which should include ecological sites, locations on the south side of the river and locations in other neighbouring local authorities. The air quality modelling should assess the impacts to these receptors. The Applicant should justify the choice of receptor locations with reference to the extent of the likely impacts and seek to agree these with the relevant consultation bodies.
4.5.9	Paragraph 8.78	Study area	The Applicant proposes to model concentrations of nitrogen oxides for sensitive receptors (including statutory designated habitat sites) within a 10km study area. The Applicant explains that this approach is in accordance with the Environment Agency's guidance on 'Air Emissions Risk Assessment for your Environmental Permit'[12]. The Inspectorate notes this guidance states that some larger (greater than 50 MW) emitters may be required to screen out to 15km for European sites and between 10 to 15kms for SSSIs. In addition to the

[12] Environment Agency (2016) 'Air Emissions Risk Assessment for your Environmental Permit' [online]: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

ID	Ref	Other points	Inspectorate's comments
			European sites identified in the Scoping Report, the ES should also assess any likely significant effects on the North Downs Woodlands Special Area of Conservation (SAC). The Inspectorate recommends that the ES contains a robust justification to support the selected study area/ s relevant to impacts from emissions to air on designated ecological sites, with reference to the extent of the likely impacts and agreement with relevant consultation bodies.
4.5.10	Paragraph 8.79	Cumulative impacts	Paragraph 8.79 of the Scoping Report explains that cumulative impacts from emissions to air would be assessed '*semi-quantitatively'.* What this would mean in practice is not explained. To demonstrate the impact of incremental changes of pollutant deposition from the operational Proposed Development together with other proposed developments, the Inspectorate recommends use of a quantitative assessment methodology, particularly in respect of other point-source emitters.
4.5.11	n/a	Impacts – construction and decommissioning	The Scoping Report does not confirm whether the air quality assessment would consider emissions to air arising from plant required for construction/ decommissioning. However, the Inspectorate notes from the Climate Change section of the Scoping Report (paragraph 8.185) that direct greenhouse gas emissions from construction plant are described as minimal. The ES should describe the plant which is likely to be required for construction/ decommissioning, the likely location and duration of their use and any mitigation measures to be implemented. The ES should assess any impacts which may result in likely significant effects on sensitive receptors as a result of emissions to air from plant required for construction/ decommissioning.

4.6 Onshore Ecology

(Scoping Report section 8.85 – 8.103)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.6.1	Table 8.5	Surveys on wintering and passage birds – other areas of development	Wintering and passage bird surveys are proposed in respect to the area affected by construction of the cooling water pipeline (if this option is taken forward). The Applicant proposes to scope out wintering and passage bird surveys in respect of the arable farmland crossed by the gas connection and access road route corridors. The Applicant considers that there is negligible potential for these areas to support important assemblages of wintering and passage birds. The Inspectorate does not agree there is sufficient evidence to support scoping out surveys for wintering and passage birds on the arable farmland crossed by the gas connection and access road route corridors. The Inspectorate notes the scoping consultation response from Natural England (see Appendix 2), which states that habitats within the application site (other than the area for the cooling water pipeline) may provide a functional linkage to the Thames Estuary and Marshes SPA and Ramsar site. The Inspectorate considers there is potential for impacts from disturbance/ displacement to birds, from the Proposed Development alone and particularly cumulatively with other developments (including from use of the existing or new jetty[13], as detailed in Table 4.7, ID 4.7.4 of this Opinion). The ES should be informed through relevant surveys of these areas and the findings reported in the ES. The Applicant should undertake further consultation with Natural England

[13] Thurrock Council planning reference 17/00224/FUL

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			in effort to agree the approach and timing of specific surveys for wintering and passage birds. The ES must fully assess impacts on the designated sites and on functionally linked land utilised by qualifying features of these sites, both alone and cumulatively with other developments.
4.6.2	Table 8.5	White clawed crayfish surveys	The Applicant proposes to scope out surveys for white clawed crayfish. Table 8.5 of the Scoping Report states *'There are no known records of this species in the area, and it is reasonable to assume that the species is absent given its proximity to the tidal influence and salinity of the Thames Estuary'.* There is no further justification of why this species should not be assessed and there is no mention of their consideration in the Preliminary Ecological Appraisal (Appendix C of the Scoping Report). The Inspectorate notes that the Phase 1 habitat survey and preliminary species surveys presented in Appendix D of the Scoping Report do not appear to have considered the area required for the potential cooling water pipeline. In the absence of this information (or confirmation that the cooling water option will not be pursued), the Inspectorate does not agree to scope out white clawed crayfish surveys. The Applicant should seek to agree the need for white clawed crayfish surveys with relevant consultation bodies. If there is potential for significant effects on white clawed crayfish, this should be assessed in the ES.
4.6.3	Table 8.5	Bat surveys	The Applicant proposes to scope out surveys for bats. Table 8.5 of the Scoping Report states that there are no potential bat roost sites in the *'main development site'* and that the development is considered highly unlikely to result in fragmentation of foraging or commuting routes given the habitats present on site. This appears to contradict

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			paragraph 8.89 of the Scoping Report, which states that these habitats may be of value to foraging and commuting bats. The Inspectorate also notes that the Phase 1 habitat survey and preliminary species surveys presented in Appendix D do not appear to have considered the area required for the potential cooling water pipeline. In the absence of this information (or confirmation that the cooling water option will not be pursued) and noting the potential suitability of habitats on the main development site for foraging and commuting bats, the Inspectorate does not agree to scope out the need for bat surveys. The Applicant should seek to agree the approach to and the need for bat surveys with relevant consultation bodies. If there is potential for significant effects on bats, this should be assessed in the ES.
4.6.4	Table 8.5	Otter surveys	The Applicant proposes to scope out surveys for otter. Table 8.5 of the Scoping Report explains no otters are recorded within 2km of the *'main development site'* and the loss of any ditches on site is not considered to have a detrimental impact on foraging otters. The Inspectorate also notes that the Phase 1 habitat survey and preliminary species surveys presented in Appendix D do not appear to have considered the area required for the potential cooling water pipeline. In the absence of this information (or confirmation that the cooling water option will not be pursued), the Inspectorate does not agree to scope out the need for otter surveys. The Applicant should seek to agree the need for otter surveys with relevant consultation bodies. If there is potential for significant effects on otters, this should be assessed in the ES.

ID	Ref	Other points	Inspectorate's comments

ID	Ref	Other points	Inspectorate's comments
4.6.5	Table 8.4	Study area	The study areas relevant to the onshore ecological assessment should be clearly defined in the ES.
4.6.6	Paragraph 8.85	Nationally designated sites in proximity to the Proposed Development	The Inspectorate notes that Natural England's consultation response (see Appendix 2 of this Opinion) explains that the nationally significant invertebrate assemblage on the adjacent Tilbury2 site could be considered to be of sufficient quality to meet the designation requirements of a SSSI and that the site is being considered for notification. The ES should assess impacts on invertebrate assemblages both alone and cumulatively with other developments where significant effects are likely.
4.6.7	Paragraph 8.86	Local Wildlife Sites (LWS)	Paragraph 8.86 of the Scoping Report states that there are two LWSs within 1km of the *'main development site'.* However Figure 2.1 (in Appendix D of the Scoping Report) identifies a number of other LWSs, including two within the application site. It also appears that the area required for the cooling water pipeline (not shown on Figure 2.1) would fall within a LWS. The ES should identify LWSs within a study area relative to the full extent of the Proposed Development and assess the likely significant effects alone and cumulatively with other developments. The Inspectorate is aware that a LWS review has been undertaken by Thurrock Council, which has resulted in amendments to LWS boundaries. The Applicant should take these amendments into account in the ES.
4.6.8	Paragraph 8.88; Appendix D	Ecological surveys	The Applicant should ensure a robust assessment of likely significant effects resulting from the Proposed Development. Ecological surveys used to inform the assessment must include the area required for the water cooling pipeline, if this option is pursued.
4.6.9	Paragraph	Potential impacts	The ES should identify and quantify all temporary or permanent

ID	Ref	Other points	Inspectorate's comments
	8.94, bullet point 1		habitat losses by type (including loss of any functionally-linked land). This should cover the entirety of the application site; including the cooling water pipeline and gas pipeline corridors as well as the main development site.
4.6.10	Paragraphs 8.94 and 8.101	Operational air quality impacts	The Inspectorate notes the intention to assess impacts from operational air quality emissions on ecological receptors. The ES should include clear cross-reference between the Onshore Ecology aspect chapter and other relevant aspect chapters e.g. air quality. The ES should assess impacts from modelled pollutant deposition levels against relevant critical loads provided in the UK Air Pollution Information System (APIS). Any likely significant effects to habitats and protected species should be assessed.
4.6.11	Paragraph 8.94, bullet point 2	Lighting	The Inspectorate considers that impacts from lighting on ecological receptors (including aquatic ecology, if the cooling water pipeline option is pursued) should be assessed where significant effects are likely.
4.6.12	n/a	Thames Estuary and Marshes Important Bird Area (IBA)	The Inspectorate notes the proximity of the Proposed Development to the Thames Estuary and Marshes IBA, which is not identified as a receptor in the Scoping Report. The ES should assess any likely significant effects to the IBA.
4.6.13	n/a	Drainage ditches	There are a number of ditches present on and around the application site. The Applicant should ensure there is suitable effort to confirm whether these ditches contain ecological receptors e.g. fish and/ or eel populations. Any likely significant effects should be assessed in the ES.
4.6.14	n/a	Invasive species	The Preliminary Ecological Appraisal (Appendix C of the Scoping Report) states that no invasive species have been found on the main development site. Surveys to identify the presence of invasive species should be undertaken for the whole application site and any necessary

ID	Ref	Other points	Inspectorate's comments
			eradication/ control measures detailed in the ES.
4.6.15	n/a	Impacts to trees	The ES should provide details of any trees which would be removed or affected by the Proposed Development and describe any mitigation measures proposed. Any likely significant effects should be assessed.

4.7 Aquatic Ecology

(Scoping Report paragraphs 8.104 – 8.120)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.7.1	Table 8.7; paragraph 8.119	Assessment of impacts from biocide	The Scoping Report explains that the use of chemical treatment/ biocide has not historically been required in respect to the once-through water cooling system at the former Tilbury Power Station. Accordingly, the Applicant does not expect that chemical treatment/ biocide will be required for the Proposed Development and as such, impacts to the aquatic environment are avoided. On the basis that the use of biocide is not required for the Proposed Development; the Inspectorate agrees that this matter can be scoped out of the assessment. The need for an assessment of biocide is directly applicable to the requirement for its use. If for any reason these proposals change and biocide or other chemicals would be discharged, an assessment of any likely significant effects (including effects on WFD water bodies) should be provided in the ES.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.7.2	Table 8.7; paragraph 8.120	Assessment of fish impingement risk	The Scoping Report proposes a passive wedge wire cylinder screening design in order to prevent fish from entering the intake cooling pipe. As such, the Applicant considers that there is no potential for impingement of fish and an assessment is not required. The Inspectorate does not consider that sufficient detail is provided in the Scoping Report in order to agree to scope this matter out of the ES. The Applicant should assess impacts resulting from fish impingement and entrainment of fish, fish eggs, larvae and other plankton where significant effects are likely. The Applicant should make effort to engage relevant consultation bodies including the Environment Agency and the Marine Management Organisation (MMO) with regards to the detailed screen design proposals. The screen design should be made with consideration to best practice protection for relevant species e.g. eels. The Inspectorate also notes that new information regarding the protection of biota from cooling water intakes has recently been published by the Environment Agency[14] and advises the Applicant to take into account its applicability. Details of the proposed screening method should be provided within the ES and the Applicant should ensure that where specific design elements are relied upon in the ES they are suitably secured.

[14] Environment Agency (2018) Protecting biota from cooling water intakes at nuclear power stations [online] Available at: https://www.gov.uk/government/publications/protecting-biota-from-cooling-water-intakes-at-nuclear-power-stations

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.7.3	Table 8.7	Impacts to saltmarsh	The Applicant considers that there is no potential for impacts to saltmarsh, however no specific justification is provided in this regard. The Inspectorate does not agree that sufficient information has been provided in order to scope this matter out. In particular, the Inspectorate notes the potential for construction and operation of the cooling water pipeline to result in changes to coastal processes and sedimentation patterns, which could impact on the saltmarsh habitats. The ES should describe the potential impacts to saltmarsh and any likely significant effects on this habitat should be assessed. This should include consideration of any cumulative effects, including with the consented new jetty[13], Tilbury2 and Tilbury Energy Centre.
4.7.4	Table 8.7; paragraph 3.35	Use of existing/ consented new jetty	The Scoping Report explains that the existing jetty or consented new jetty[13] (if constructed) for the Goshems Farm land raising operation will be used, if construction materials are to be delivered by barge. No dredging of the seabed or refurbishment of the jetty would be required. The Applicant considers that the *'limited and temporary intensification of jetty use'* (relative to the existing use) would not result in any significant effects on the aquatic environment. The Inspectorate considers that additional justification should be provided to support this statement, particularly in terms of the anticipated number and frequency of deliveries and the cumulative impact with other proposed developments. In addition to aquatic receptors, the Inspectorate considers that there may be impacts from use of the jetty in terms of increased disturbance to birds (as referenced in Table 4.6, ID 4.6.1 above). The Inspectorate does not agree to scope out this matter out of the ES.

ID	Ref	Other points	Inspectorate's comments
4.7.5	Paragraph 8.108 and Table 8.6	Baseline information	Table 8.6 of the Scoping Report summarises the proposed approach to aquatic surveys that will inform the assessment. Details including sampling locations, equipment, methodology and level of sample replication should be provided in the ES. Table 8.6 shows that several surveys are not programmed in until Winter 2018; Spring/ Summer 2019. The Applicant should ensure that the ES is informed by relevant and up to date survey information; the Applicant should also make effort to agree the sufficiency of surveys with relevant consultation bodies.
4.7.6	Paragraph 8.109	Construction of cooling water pipeline	If the construction of the cooling water pipeline would occur outside of the wintering period, then surveys should be taken of any species which may use the area affected and not solely for survey for usage by intertidal bird species (as detailed in the Onshore Ecology chapter of the Scoping Report).
4.7.7	Paragraph 8.110	Impacts from underwater noise	The potential impacts from underwater noise to sensitive aquatic receptors should be assessed using species-specific methodologies, supported by recent scientific literature. For example Popper *et al* (2014) in relation to fish and National Marine Fisheries Service (NMFS) (2016) in relation to marine mammals. Any measures to mitigate impacts from underwater noise should be described in the ES.
4.7.8	Paragraph 8.110	Impacts from operational water cooling pipeline	The assessment of potential impacts from the operational water cooling pipeline should include impacts resulting from scour (and any associated habitat loss), as well as from access and maintenance of the pipeline. The likely timings of maintenance works should be explained, with a focus on avoidance of sensitive periods for birds. Any proposals for mitigating and/ or monitoring the impacts from the cooling water system should be described in the ES.

ID	Ref	Other points	Inspectorate's comments
4.7.9	Paragraph 8.110	Impacts from sedimentation and changes in coastal processes	Paragraph 8.110 of the Scoping Report explains that construction of the cooling water pipeline may result in disturbance/ suspension of sediments. The Inspectorate advises that these impacts should also be considered in relation to operation of the water cooling pipeline. The ES should explain how much sediment may be re-suspended, over what timeframe and whether contaminants are likely to be present. The Applicant should discuss and agree the assessment approach (including the need for chemical analysis) with relevant consultation bodies including the Environment Agency. Any other impacts to coastal processes should be described in the ES and assessed where significant effects are likely.
4.7.10	Paragraph 8.118	Thermal plume and fish entrainment modelling.	Where relevant, the ES should explain the extent of the Zone of Influence which has been identified for the thermal plume modelling and fish entrainment modelling. The ES should provide details of the modelling undertaken to determine the extent of thermal influence and to predict changes in the flow field, including the cooling water discharge rate. The thermal plume modelling should consider the impact on marine ecology including fish and benthos, both alone and cumulatively with other developments. The Inspectorate considers that the Applicant should have regard to the technical appendix provided in the Environment Agency's scoping consultation response (see Appendix 2 of this Opinion), which provides specific advice in relation to thermal modelling. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies.

ID	Ref	Other points	Inspectorate's comments
4.7.11	Paragraph 8.136	Impacts from piling	Paragraph 8.136 of the Scoping Report explains that construction noise from piling has the potential to adversely affect wildlife and bird species, but it is not clear whether any of the proposed structures in the marine environment would require piling. If piling is required within the marine area, the Applicant should model the predicted noise levels and assess any likely significant effects to aquatic receptors.
4.7.12	n/a	Impacts from dredging	If the cooling water pipeline option is pursued, the Inspectorate assumes that construction and maintenance dredging may be required. The assessment in the ES should take into account the areas to be dredged and the dredging techniques to be employed; the anticipated quantity of material to be removed and the maximum dredging depth; the frequency of maintenance dredging; and the final disposal location of dredged material. The ES should assess the impacts associated with any dredging of the River Thames, taking into account its status as a Water Framework Directive (WFD) water body (see also the Inspectorate's comments regarding the WFD in Table 4.9, ID 4.9.7 of this Opinion). Any cumulative impacts from dredging (e.g. with Tilbury2 and Tilbury Energy Centre) which are likely to result in significant effects should also be assessed.
4.7.13	n/a	Marine Conservation Zone (MCZ)	The Inspectorate is aware that the consultation for the MCZ has now closed and this affects its status. The ES should appropriately assess impacts to the MCZ.
4.7.14	n/a	Cumulative impacts	The Applicant should identify other developments with the potential to impact on the marine environment in the Thames Estuary and assess the potential for cumulative impacts together with the Proposed Development.

4.8 Noise and Vibration

(Scoping Report paragraphs 8.121 – 8.142)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.8.1	Paragraph 8.142	Impacts from operational traffic noise	Paragraph 8.142 of the Scoping Report proposes to scope this matter out of the ES, explaining that *'traffic generation in operation would be negligible'.* Paragraph 9.10 of the Scoping Report further explains that the Proposed Development would largely be operated remotely and there would be no permanent staff present on a day-to-day basis. Impacts from operational traffic vibration are not mentioned, but the Inspectorate assumes that the same justification would apply. The Inspectorate considers that significant effects from operational traffic noise and vibration from the Proposed Development alone are unlikely to occur and agrees that this matter can be scoped out of the ES. However, the ES should address cumulative impacts from operational traffic noise from the Proposed Development together with other developments (including Tilbury2, Tilbury Energy Centre and the Lower Thames Crossing).
4.8.2	Paragraphs 8.135 and 8.142	Quantitative assessment of operational vibration	Paragraph 8.135 of the Scoping Report explains that the main source of operational vibration will be from the gas engines. Due to rapid attenuation of vibration levels and the distances to receptors sensitive to vibration, the Applicant considers significant effects from operational vibration area unlikely to occur. The Scoping Report does not explain whether vibration could occur from operation of other development components, such as the gas pipeline and AGI. Having regard to the characteristics of the Proposed Development and the distance to sensitive receptors, the Inspectorate considers that significant vibration effects from operation of the Proposed

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			Development are not likely to occur. A quantitative assessment of operational vibration is not necessary and can be scoped out of the ES.

ID	Ref	Other points	Inspectorate's comments
4.8.3	Paragraphs 8.122 to 8.127	Sensitive receptors	Paragraphs 8.122-127 of the Scoping Report describe the noise sensitive receptors relative to the main development site only. Specific vibration sensitive receptors have not been defined. The ES should contain a comprehensive list and figure illustrating the locations of receptors sensitive to noise and vibration impacts, relative to the entirety of the Proposed Development including elements beyond the main development site. Residential, recreational and ecological receptors should be selected, including locations on the south side of the River Thames. It should be clear how other aspects (for example, construction traffic routes to the different parts of the application site) relate to the choice of sensitive receptors. The assessment of noise and vibration impacts on sensitive ecological receptors e.g. birds and fish should take into account the seasonality of potentially affected species. Cross reference should be made to the ecological impact assessment in the ES. For the assessment of cumulative impacts, the Applicant should consider the noise and vibration sensitive receptors selected for other developments in the area including Tilbury2, Tilbury Energy Centre and Lower Thames Crossing.
4.8.4	Paragraph 8.130	Construction impacts	The Scoping Report explains that impact piling may be required. The ES should detail the modelling undertaken, including the input parameters such as the number, location and size of piles. Any cumulative impacts from piling (e.g. with Tilbury2 and Tilbury Energy

			Centre) which are likely to result in significant effects should also be assessed. Aside from piling, the ES should identify all sources of noise and vibration which may result from the Proposed Development, including those which cross other developments and those which extend into the marine area. Where uncertainty exists and flexibility is required the assessment should be based on a worst case scenario.
4.8.5	Paragraph 8.131	Construction impacts	If the option to transport construction materials/ abnormal loads via water is pursued, noise impacts from ships/ barges should be assessed where significant effects are likely.
4.8.6	Paragraph 8.138	Construction impacts	The ES should provide details of the anticipated working hours (including any night time working required) and incorporate this into the noise level predictions and assessment of likely significant effects. This should be consistent with the working hours specified in the dDCO.
4.8.7	Paragraph 8.138	Noise level predictions	It should be clear what assumptions have been made to develop and inform noise modelling. This would include the placement of construction activities/ plant within the application site; and how the likely noise levels generated by the necessary construction activities/ plant have been estimated. If uncertainty exists and flexibility is sought, the noise impact assessment should be undertaken on the basis of a worst case scenario.
4.8.8	Paragraph 8.141	Vibration from Heavy Goods Vehicles (HGVs)	Paragraph 8.141 of the Scoping Report explains that impacts from traffic noise arising from construction and decommissioning of the Proposed Development will be assessed. However it is unclear whether the Applicant intends to assess the impact of ground-borne vibration from HGVs during construction and decommissioning. The ES should assess impacts from ground-borne vibration from HGV traffic during construction and decommissioning where significant effects are likely. This should include consideration of cumulative

			impacts with other developments. Any such assessment should be based on the traffic modelling and likely HGV movements. The vibration sensitive receptors should be identified and shown on a supporting plan within the ES.
4.8.9	Paragraph 8.141	Assessment method	The ES should fully explain how the predicted noise levels relate to the 'base year' and 'with development' traffic data predictions. Cross reference should be made to the Traffic and Transport aspect chapter where relevant.
4.8.10	n/a	Significant Observed Adverse Effect Level (SOAEL) and Lowest Observed Adverse Effect Level (LOAEL)	Consistent with the Noise Policy Statement for England, LOAEL and SOAEL should be defined for all of the noise and vibration matters assessed. Mitigation measures should be set out accordingly.
4.8.11	n/a	Noise limits and monitoring	The ES should define noise limit values and explain how they were determined. The ES should explain the need for monitoring of noise to ensure adherence to the specified noise limits and the appropriateness of mitigation. The need for and scope of monitoring during construction, operation and decommissioning of the Proposed Development should be agreed with relevant consultation bodies and presented in the ES, along with an explanation of how it is secured.

4.9 Water Resources and Flood Risk

(Scoping Report paragraphs 8.143 – 8.163)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.9.1	n/a	n/a	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Other points	Inspectorate's comments
4.9.2	Paragraph 8.145	Thames Estuary 2100 (TE2100) plan	The Inspectorate has had regard to the consultation response from the Environment Agency regarding the TE2100 plan for maintaining or improving the current standards of flood protection on the estuary. The Applicant should make effort to consult with the Environment Agency regarding interactions between the Proposed Development and the TE2100. Where significant environmental effects are likely these should be assessed within the ES.
4.9.3	Paragraph 8.152	Data	If any additional site specific hydrological data is acquired from site reconnaissance or consultation with another body, this information should be included within the ES.
4.9.4	Paragraph 8.154	Scope of the assessment	The Inspectorate notes that only *'temporary changes'* to surface water flows within Flood Zone 3 during construction will be assessed. The Scoping Report does not define the term *'temporary changes'*. For the avoidance of doubt the ES should assess any likely significant effects resulting from changes to surface water flows within Flood Zone 2 during relevant stages of construction.
4.9.5	Paragraph 8.154	Scope of the assessment	As the Proposed Development is located within Flood Zone 3, an assessment of whether the Proposed Development can remain safe and operational during a worst case flood event should be undertaken,

ID	Ref	Other points	Inspectorate's comments
			and included within the ES.
4.9.6	Paragraph 8.154	Loss of floodplain storage	The Proposed Development is situated within a floodplain storage area, but the Scoping Report has not stated whether the Proposed Development will result in a net loss of floodplain storage. The ES should quantify and assess the impacts from the Proposed Development to floodplain storage.
4.9.7	Paragraph 8.154	Water Framework Directive (WFD)	Paragraph 8.154 of the Scoping Report confirms that the ES will consider potential impacts on WFD water bodies. The Applicant's attention is drawn to the Inspectorate's Advice Note Eighteen: The WFD in this regard. The Applicant should make effort to discuss and agree the approach to the assessment of water quality and the need for additional sampling (further to that set out in Table 8.6 of the Scoping Report) with the Environment Agency. The ES should explain the relationship between the Proposed Development and any relevant water bodies in relation to the current relevant River Basin Management Plan. If the decision regarding the cooling water infrastructure cannot be made prior to submission of the DCO application, the ES should describe and assess all possible scenarios likely to result in significant effects on relevant water bodies.
4.9.8	Paragraph 8.157	Methodology for: • probability of harm; and • magnitude of impact.	The Scoping Report does not define the term '*probability of harm'* or describe how a probability of harm will be assigned to receptors. The ES should provide a definition of this term and include a detailed description of the methodology used to determine the *'probability of harm'* to a receptor. Scoping Report paragraph 8.157 states that the significance of predicted effects will be determined in part by the magnitude of predicted impact. The methodology used to determine the magnitude

ID	Ref	Other points	Inspectorate's comments
			of the predicted impact should also be set out within the ES.
4.9.9	Paragraphs 8.157 to 8.162	Flood Risk Assessment (FRA)	All potential sources of flooding which could result in likely significant effects should be assessed in the ES. Consideration should be given to the potential for groundwater, surface water and sewer flooding (where relevant), as well as tidal and fluvial flooding. The assessment should take into account predicted impacts from climate change. A breach assessment should also be undertaken.
4.9.10	Paragraphs 8.159 and 3.11	Drainage	The Scoping Report indicates that a drainage strategy including new drainage features will be developed. The Applicant should make efforts to engage with relevant consultation bodies on the design of the new drainage system and any related outfalls. The assessment should take into account any resultant impacts on the integrity of the tidal flood defences protecting the site, which the Environment Agency's scoping consultation response (see Appendix 2 of this Opinion) explains are currently in poor condition. Any interactions with other aspect assessments (for example, the aquatic environment) should be considered, where relevant.
4.9.11	Paragraph 8.160	Climate change allowance	Any uncertainties or assumptions encountered when using the climate change model to assess impacts to water resources and flood risk should be stated within the ES.
4.9.12	Paragraph 8.161	Future baseline	The Scoping Report does not state the timeframe for the future baseline. The Inspectorate assumes that the timeframe for the future baseline will be the 12 month construction period from 2021-2022; however, this should be clearly stated within the ES.
4.9.13	Paragraph 8.161	Mitigation measures	The Scoping Report (paragraph 8.161) refers to the sufficiency of proposed mitigation. However, no mitigation measures have been described within the Water Resources and Flood Risk section of the Scoping Report. The ES should include a full description and efficacy

ID	Ref	Other points	Inspectorate's comments
			assessment of any proposed mitigation measures, as well as the residual effect. The Applicant should seek to discuss and agree the need for more detailed consideration of flood warning and evacuation plans with relevant consultation bodies. Paragraph 3.11 of the Scoping Report does state that Sustainable Drainage (SuDS) feature will be used as a mitigation measure to prevent surface water flooding. The location of SuDS and an assessment of their efficacy should be included within the ES.
4.9.14	n/a	Tidal flood risk	The Scoping Report does not address any potential changes in tidal flooding caused by the Proposed Development. The Inspectorate notes that the land required for the cooling water pipeline (development zone 'K' on Figure 2 of the Scoping Report) is partially located within the River Thames and has the potential to affect tidal flood patterns at a local level. The ES should take this into account and consider whether development in zone 'K' may impact tidal flooding events. The Applicant should make effort to agree the approach to the assessment of tidal flooding with relevant consultation bodies including the Environment Agency. The ES should include an assessment of impacts to tidal flooding from the Proposed Development where significant effects are likely.
4.9.15	n/a	Public highway adjustments	The Inspectorate notes that the public highway adjustments have not been referenced within the aspect chapter. The ES should include an assessment into how water resources and flood risk may be affected by the public highway adjustments taking into account relevant guidance. If any mitigation measures are required to prevent significant effects occurring to the water resources and flood risk arising from the public highway adjustments, a description and efficacy assessment of the proposed mitigation measures should be included within the ES.

4.10 Geology, Hydrogeology and Land Contamination

(Scoping Report paragraphs 8.164 – 8.177)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.10.1	n/a	n/a	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Other points	Inspectorate's comments
4.10.2	Paragraphs 8.164 to 8.171	Baseline conditions	The Scoping Report describes the baseline conditions for the main development site. A description of baseline conditions for the entirety of the application site should be included within the ES. The baseline description should include reference to sites of geological importance, and state whether the Proposed Development has potential to effects sites of geological importance.
4.10.3	Paragraph 8.165	Landfills	The Scoping Report states that numerous landfills and historic landfills are located around the entirety of the Proposed Development's order limits. The landfill locations should be presented on a figure in the ES to aid understanding. An assessment of any likely significant effects arising from the migration of contaminants and ground gas should be included within the ES. Scoping Report paragraph 8.165 states that '*there has been no anthropogenic activities on the main development site',* but no information has been provided for the rest of the order limits. If anthropogenic activities have occurred within other sections of the application site, a description of these activities and the potential for likely significant effects should be provided within the ES.
4.10.4	Paragraph	Source Protection Zone (SPZ)	Scoping Report paragraph 8.171 states that the *'site is not indicated to be located within a Source Protection Zone'.* However, according to

ID	Ref	Other points	Inspectorate's comments
	8.171		the Department for Agriculture and Rural Affairs (Defra) MAGIC map, development sites 'D' and 'E' are situated within SPZ 3. An assessment into the potential effects that construction, operation and decommissioning activities within sites 'D' and 'E' may have on the SPZ should be included within the ES where significant effects are likely.
4.10.5	Paragraph 8.172	Scope of the assessment	The Scoping Report states that if piling is required, it has the potential to mobilise *'contaminants of concern'* within shallow soils, groundwater and deeper aquifers. The assessment should take into account all types of contaminants that could result in likely significant effects on shallow soils, groundwater and deeper aquifers.
4.10.6	Paragraph 8.173	Receptors	No receptors have been identified within the aspect chapter. A list of sensitive receptors and their locations should be included within the ES. The methodology used to determine the sensitivity of receptors should be agreed with relevant consultation bodies and included within the ES.
4.10.7	Paragraph 8.174	Further investigations	If the Applicant conducts intrusive investigations, the details of these investigations and an assessment of the results should be included within the ES.
4.10.8	Paragraph 8.176	Mitigation	The aspect chapter lacks any description of potential mitigation measures. The ES should include a full description of any potential mitigation measures, as well as an assessment of the efficacy of the proposed mitigation measures. The Applicant should consider implementing a Soil and Waste Management Plan (SWMP) to provide a detailed description outlining how soils will be handled and stored to prevent contamination of soils and the degradation of soil quality.
4.10.9	Paragraph	Remediation	The ES should include a full description of any remediation which may

ID	Ref	Other points	Inspectorate's comments
	8.176		be required and confirm how this is to be secured. The ES should assess any likely significant effects which could occur as a result of remediation. Any assumptions in this regard (for example, traffic movements, waste handling, and contaminated land) should be clearly stated in the ES.
4.10.10	n/a	Impacts	The ES should confirm whether any groundwater abstraction or dewatering would be required as part of the Proposed Development. Any likely significant effects, including those on WFD groundwater bodies, should be assessed.
4.10.11	n/a	Study area	The aspect chapter has not stated the assessment study area. The Applicant should make effort to agree the study area with relevant consultation bodies and ensure that it sufficiently encompasses the entirety of the impacts arising from the Proposed Development, where significant effects are likely.
4.10.12	n/a	Hydrogeological data	The Scoping Report provides very limited hydrogeological data although paragraph 8.152 states that site specific hydrogeological data will be obtained. If this data is relevant to the groundwater and potential contamination pathways, then the data should be clearly stated and addressed in the ES.
4.10.13	n/a	Cooling water pipeline and gas pipeline	The baseline conditions in respect to the land required for the cooling water pipeline and gas pipeline are not clearly defined in this section of the Scoping Report. The underlying geological and hydrogeological conditions that exist beneath the proposed cooling water and gas pipelines should be included within the baseline description. The Scoping Report should assess impacts that may arise as a result of construction of the new pipelines, including the potential for the pipelines to create new contamination pathways and alter groundwater flow and field drainage.

ID	Ref	Other points	Inspectorate's comments
4.10.14	n/a	Public highway adjustments	The Inspectorate notes that the public highway adjustments have not been referenced within this aspect chapter of the Scoping Report. The ES should include an assessment outlining how geology, hydrogeology and land contamination may be affected by any public highway adjustments taking into account relevant guidance. Any mitigation measures relied upon in the assessment should be clearly described and assessed in the ES. The ES should also explain how any such measures are secured with reference to the DCO or other suitably robust methods.

4.11 Climate Change

(Scoping Report paragraphs 8.178 – 8.197)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.11.1	Paragraph 8.183	Assessment of greenhouse gas (GHG) emissions generated by operational activities (other than natural gas combustion and through the gas fuel supply chain)	The Applicant proposes an assessment of operational GHG emissions arising from natural gas combustion, as well as GHG emissions generated through the gas fuel supply chain. The Applicant considers that GHG emissions from other operational activities (e.g. occasional maintenance staff traffic and non-fuel process consumables, such as lubricants) would be minimal and are not proposed to be assessed. The Inspectorate considers that GHG emissions from operational activities (other than natural gas combustion and through the gas fuel supply chain) are unlikely to result in significant effects and agrees that this matter can be scoped out of the assessment.
4.11.2	Paragraph 8.185	Assessment of direct GHG emissions from construction activities	The Scoping Report explains that the main impact in respect to construction-stage GHG emissions would be indirect emissions from the construction material supply chain, an assessment of which would be provided in the ES. Direct GHG emissions from construction activities (e.g. fuel consumption by construction plant) are considered to be minimal and are not proposed to be assessed. Considering the scale and duration of the construction phase, the Inspectorate is content that direct GHG emissions from construction activities are not likely to lead to significant effects and agrees that this matter can be scoped out of the ES. Notwithstanding this, the Applicant's attention is drawn to the Inspectorate's comments in Table 4.5, ID 4.5.11 regarding the need to assess any likely significant effects on sensitive receptors as a result of emissions to air from construction plant.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.11.3	Paragraph 8.186	Assessment of GHG emissions from decommissioning development components (where end-of-life information is not available)	The Scoping Report explains that GHG emissions during decommissioning of the Proposed Development would depend principally on the recycling/ reuse options for development components at that time. Where Environmental Performance Declarations (EPDs) for the development components include end-of-life within the lifecycle boundary, the Applicant proposes to include these impacts in the assessment. Where EPDs do not include this information, the Applicant considers that GHG impacts cannot be predicted with confidence and as such, are not proposed to be assessed. The Inspectorate agrees that this is a reasonable approach. The Scoping Report does not specifically state whether an assessment of direct GHG emissions from decommissioning activities (e.g. fuel consumption by plant) is proposed. Considering the likely scale and duration of the decommissioning phase, the Inspectorate is content that direct GHG emissions from decommissioning activities are not likely to lead to significant effects and that this matter can be scoped out of the ES. Notwithstanding this, the Applicant's attention is drawn to the Inspectorate's comments in Table 4.5, ID 4.5.11 regarding the need to assess any likely significant effects on sensitive receptors as a result of emissions to air from plant required for decommissioning.
4.11.4	Paragraphs 8.189 and 8.197	Climate change risks and adaptation relating to changes in temperature, humidity and wind speed	An assessment of climate change risks and adaptation is proposed in respect to changes in rainfall and flood risk. The Applicant has reviewed the Met Office UK Climate Projections 'UKCP09' dataset and considers that changes in temperature, humidity and wind speed (over the Proposed Development's operational lifetime of *'around 35 years'*) would be of low magnitude and proposes to scope out an assessment of these matters from the ES. The Inspectorate notes that UKCP18 will be available from November

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			2018 and the potential for the Proposed Development to operate beyond 35 years, as described in paragraph 3.2 of the Scoping Report: '*The Proposed Development will be designed to operate for at least 35 years, after which ongoing operation and market conditions will be reviewed'.* In view of these uncertainties, the Inspectorate is not in a position to scope out this matter. The ES should describe any potential impacts from changes in temperature, humidity and wind speed (including resilience to such impacts) with reference to the UKCP18 and the anticipated lifespan of the Proposed Development. If significant effects are likely, these should be assessed.
4.11.5	Paragraph 8.196	Assessment of cumulative GHG impacts with other proposed development	Cumulative impacts of GHG emissions from the Proposed Development, together with other specific developments, are not proposed to be assessed for *'atmospheric concentrations of GHGs'* as a receptor. The Inspectorate agrees that the assessment of GHG emissions on the atmosphere is by nature cumulative and that an assessment of cumulative GHG impacts with other proposed development can be scoped out of the ES.

ID	Ref	Other points	Inspectorate's comments
4.11.6	Paragraphs 8.190 and 8.192	Calculation of GHGs	The ES should set out the calculation methods used to quantify the GHG emissions relating to the Proposed Development.
4.11.7	Paragraph 8.195	Assumptions and limitations	The ES should state any assumptions made in calculating the predicted GHG emissions, any limitations to the calculations and any uncertainties this presents for the assessment of GHG emissions.

4.12 Major Accidents and Disasters

(Scoping Report Section 9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.12.1	Paragraph 9.5	A separate ES chapter concerning environmental effects arising from the vulnerability of the Proposed Development to major accidents and disasters	The Applicant proposes to scope out a standalone aspect chapter concerning 'major accidents and disasters'. Instead, the Applicant proposes to consider major accidents and disasters from flooding in the Water Resources and Flood Risk aspect chapter; and major accidents and disasters from fire and explosion risks within the ES project description chapter. The Inspectorate is content that provision of the assessments within other relevant ES aspect chapters should not impede the ability of the ES to adhere with the EIA Regulations. The Applicant should ensure that the introductory sections of the ES contain clear cross referencing to where the assessment of major accidents or disasters is located.

ID	Ref	Other points	Inspectorate's comments
4.12.2	Paragraph 9.4	Vulnerability to major accidents and disasters from flooding	The assessment of major accidents and disasters from flooding should include consideration of extreme storm surge events and tidal flooding.
4.12.3	Paragraph 9.5	Vulnerability to major accidents or disasters from fire and explosion risks	The Inspectorate notes the intention to *'discuss'* principles/ measures to mitigate fire and explosion risks in the project description chapter of the ES. The Inspectorate also notes the potential for the proposed gas pipeline to interact with the Lower Thames Crossing and the gas pipeline for Tilbury Energy Centre. For the avoidance of doubt, the Inspectorate considers that an assessment of likely significant effects arising from the vulnerability of the Proposed Development to major accidents or disasters from fire

ID	Ref	Other points	Inspectorate's comments
			and explosion risks should be provided in the ES where significant effects are likely.

4.13 Human Health

(Scoping Report Section 9)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
4.13.1	Paragraph 9.7	A separate ES chapter concerning Human Health	The Applicant proposes to scope out a standalone 'Human Health' aspect chapter and instead, to consider the potential impacts to human health within the relevant aspect chapters (described as air quality, noise, ground or water contamination). The Inspectorate is content that this approach should not impede the ability of the ES to adhere with the EIA Regulations. The Applicant should discuss with relevant consultation bodies appropriate ways of ensuring the relevant information is clearly presented and accessible (in absence of a standalone aspect chapter); for example through clear cross referencing to where the assessment of impacts to human health receptors is located.

ID	Ref	Other points	Inspectorate's comments
4.13.2	Paragraph 9.7	Assessment	The Inspectorate notes that impacts to human health from air quality are to be considered and advises that this includes consideration of impacts from construction dust. The Applicant's attention is drawn to Table 4.16, ID 4.16.1 of this Opinion in respect of impacts to human health from electric and magnetic fields (EMF). The assessment of impacts to human health should consider all phases of the Proposed Development, alone and cumulatively with other developments.

ID	Ref	Other points	Inspectorate's comments
4.13.3	Paragraph 9.7	Sensitive receptors	Specific sensitive receptors for the purposes of the human health assessment have not been proposed in the Scoping Report. The ES should identify the locations of the sensitive receptors (and their distances from the Proposed Development) and explain how these have been selected, with reference to the extent of the likely impacts. Consideration should be given to people living in residential premises, people at work/ school/ in healthcare facilities, people using recreational areas/ transport infrastructure routes/ publically accessible land, waterbodies and any drinking water supplies.

4.14 Waste Management

(Scoping Report Section 9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.14.1	Paragraphs 9.8 and 9.9	Assessment of impacts from waste produced during construction	The Applicant explains that the potential for construction waste generation would be minor (noting that no demolition works are required) and that mitigation and management measures would be implemented through the CEMP. As such, the Applicant proposes that an assessment of impacts from construction waste is scoped out of the ES. The Inspectorate has considered the potential impacts from the transport and disposal of construction waste, including those which could arise from encountering unexpected waste types or contaminants relating to the landfill sites on/ around the application site. The Inspectorate does not agree that an assessment of impacts from construction waste can be scoped out of the ES. The ES should assess any impacts from waste produced from construction which are likely to result in significant effects.
4.14.2	Paragraph 9.10	Assessment of impacts from waste produced during operation	The Applicant explains that operation of the Proposed Development would not involve any significant waste generating activities. The Inspectorate agrees that significant effects are not likely to occur and this matter can be scoped out of the ES.
4.14.3	Paragraph 9.11	Assessment of impacts from waste produced during decommissioning	With regards to decommissioning, the Scoping Report notes that the Proposed Development will be pre-engineered and modular in nature, which would facilitate removal of components from the site during decommissioning of the Proposed Development. As such, the Applicant considers that decommissioning of the Proposed Development would generate only limited amounts of waste and proposes to scope this matter out of the ES.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			Having regard to the characteristics of the Proposed Development, the Inspectorate agrees that significant effects are not likely to occur and an assessment of impacts from waste produced during decommissioning can be scoped out of the ES.

ID	Ref	Other points	Inspectorate's comments
4.14.4	n/a	Impacts from transport of waste produced during construction	The ES should identify the likely number of vehicular movements required to remove waste generated during construction of the Proposed Development. The ES should assess the impacts which may result in likely significant effects from the transport of waste generated during construction of the Proposed Development. Cross-reference should be made to the Traffic and Transport chapter of the ES, as appropriate. Any assumptions made (such as with regards to quantities of contaminated land) should be clearly set out and justified in the ES.
4.14.5	n/a	Anticipated quantities of waste	The ES should quantify the likely volumes of construction waste (including the potential hazardous waste arising) and explain how these figures have been determined. The Applicant should consult relevant consultation bodies including Thurrock Council (and other neighbouring councils, if required) to identify the locations of suitable waste disposal facilities for both hazardous and non-hazardous waste. These facilities should be identified in the ES and any likely significant effects on their capacity should be assessed.
4.14.6	n/a	Cumulative impacts	The ES should consider the potential for cumulative impacts with other developments, particularly in terms of the transport and disposal of construction waste.

4.15 Material Assets and Natural Resources

(Scoping Report Section 9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.15.1	Paragraphs 9.12 to 9.14	A separate ES chapter on material assets and natural resources	The Scoping Report explains that the Proposed Development would be located on undeveloped agricultural land and Common Land, impacts to which would be assessed in the relevant ES aspect chapters. The Applicant considers that no other material assets or infrastructure would be adversely affected by the Proposed Development. In terms of natural resources, the Applicant explains that gas fuel would be utilised during operation of the Proposed Development; it is proposed that the likely impacts are assessed in the Climate Change aspect chapter of the ES. As such, the Applicant proposes that a separate aspect chapter on 'Material Assets and Natural Resources' is not provided. The Inspectorate is content that these matters can be assessed within the relevant aspect chapters of the ES.

ID	Ref	Other points	Inspectorate's comments
4.15.2	n/a	Minerals Assessment	The Scoping Report does not confirm whether a minerals assessment will be undertaken. The ES should identify and assess any likely significant effects on mineral resources. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies.

4.16 Radiation

(Scoping Report Section 9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.16.1	Paragraph 9.15	An assessment of impacts from EMF	The Applicant considers that as the Proposed Development is located immediately adjacent to the existing Tilbury Substation with minimal distance for the grid connection, there is no potential for public exposure to EMF generated. The Inspectorate notes that the underground cable will exceed 132kV (as referenced in the DECC voluntary Code of Practice). The Applicant must provide sufficient evidence to demonstrate compliance with the ICNIRP restrictions[15], in accordance with the DECC voluntary Code of Practice[16]. If significant effects associated with increased EMF are likely, this should be assessed in the ES. The Applicant should take into account any in combination impacts from EMF associated with existing infrastructure (e.g. the existing substation and the 400kV and 275kV overhead lines crossing the application site). As such, the Inspectorate does not agree that this matter can be scoped out of the ES.
4.16.2	Paragraph 9.16	An assessment of impacts on electronic interference	The Applicant explains that the Proposed Development (including any temporary structures required for construction, such as cranes) will be

[15] Exposure guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) in 1998

[16] Power Lines: Demonstrating compliance with EMF public exposure guidelines, a voluntary code of practice (DECC, 2012)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			no higher than existing or previous structures in the surrounding area. The Applicant considers that an assessment of impacts from the Proposed Development on electronic interference is not required. The Inspectorate agrees that significant effects are unlikely to occur and an assessment of impacts to electronic interference can be scoped out of the ES.

4.17 Heat and Light

(Scoping Report Section 9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.17.1	Paragraphs 9.17 to 9.20	An assessment of impacts from heat, with the exception of the potential impacts from heat on marine ecology (if the water cooling option is selected)	The Scoping Report states that impacts from heat on aquatic receptors (if the water cooling option is selected) will be assessed in the Aquatic Ecology chapter of the ES. The Inspectorate agrees that this is appropriate. If the air cooling option is selected, the Applicant does not anticipate any likely significant effects resulting from heat. With the exception of impacts from heat on aquatic receptors (if the water cooling option is selected), the Inspectorate is content that significant effects resulting from heat are not likely to occur and that this matter can be scoped out of the ES.
4.17.2	Paragraphs 9.19 and 9.20	An assessment of impacts from lighting, with the exception of potential impacts from light on ecological receptors	The Scoping Report explains that security lighting '*may be required*' for the main development site, with any resultant impacts to ecological receptors to be considered in the ecology chapter of the ES. Considering the distances to residential receptors, no significant effects from lighting (in terms of visual amenity) are anticipated by the Applicant and paragraph 9.20 proposes that this matter is scoped out. This appears to be contradicted by paragraph 8.16 of the Scoping Report, which indicates that night time effects on visual receptors will be assessed. The Inspectorate agrees that impacts from lighting on ecological receptors (including aquatic ecology, if the water cooling option is pursued) should be assessed and advises that this should include all phases of the Proposed Development. The Inspectorate also notes the relatively undeveloped, rural nature of the application site. Whilst specific details of the lighting requirements are not provided, the Inspectorate assumes that during operation,

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			permanent night-time lighting would be required for the main development site. There is also potential for cumulative visual effects from lighting associated with other proposed developments. As such, the Inspectorate considers that any likely significant effects on the visual amenity of residents arising from night -time construction and operational lighting should be assessed. Any impacts from lighting on navigation should also be assessed where significant effects are likely.

4.18 Aviation

(Scoping Report Section 9)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
4.18.1	Paragraphs 9.21 to 9.23	Assessment of impacts on aviation	The Scoping Report explains that the nearest airfield (Thurrock Airfield) is approximately 8.5km from the application site and the tallest permanent structures (the stacks) would be up to 40m in height. The Applicant therefore considers that significant impacts to aviation are not likely to occur and proposes that an assessment is scoped out of the ES. Notwithstanding this, the Applicant intends to consult with the Civil Aviation Authority regarding aviation lighting and charting. The Inspectorate agrees that significant effects are unlikely to occur and an assessment of impacts to aviation can be scoped out of the ES.

4.19 Combined Heat and Power (CHP)

(Scoping Report Section 9)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
4.19.1	Paragraphs 9.24 to 9.27	Assessment of CHP opportunities and environmental impacts from CHP infrastructure	The Applicant notes the requirement in NPS EN-1 for developers of new thermal generating stations to consider opportunities for CHP. The Applicant explains that as a peaking plant, the Proposed Development is poorly suited to CHP generation. An assessment of CHP opportunities and environmental impacts from CHP infrastructure is therefore proposed to be scoped out of the ES. The Inspectorate is content that if CHP does not form part of the DCO application, this matter can be scoped out of consideration in the ES.

4.20 Carbon Capture Readiness

(Scoping Report Section 9)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
4.20.1	Paragraphs 9.28 to 9.31	Assessment of impacts from any future application for carbon capture and storage (CCS)	The Applicant explains that whilst land will be set aside within the application site for future CCS, consent for a CCS development will not be sought as part of the DCO application. Should a CCS development be pursued in the future, this would be subject to a separate planning application. As such, the Applicant proposes that an assessment of impacts from any future CCS development is scoped out of the ES and the Inspectorate agrees that this is acceptable. The Applicant does however intend to consider the impacts of the land-take for Carbon Capture Readiness within the ES. The Inspectorate agrees with this approach.

4.21 Cumulative Effects

(Scoping Report paragraphs 6.45 to 6.61)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.21.1	n/a	n/a	No matters have been proposed to be scoped out of the assessment.

ID	Ref	Other points	Inspectorate's comments
4.21.2	Paragraph 6.58	Impacts	The Scoping Report does not explain whether there is potential for cumulative impacts with the proposed London Resort (located on the south bank of the River Thames). This should be confirmed in the ES.
4.21.3	Paragraph 6.58	Impacts	The potential for cumulative effects with the consented new jetty for the Goshems Farm land raising operation should be considered in the assessment.
4.21.4	Paragraph 6.58	Impacts	The scale of development proposed in the Tilbury area requires detailed consideration of both temporary and permanent cumulative effects; as such the Inspectorate recommends that the cumulative assessment is presented in a standalone aspect chapter. In particular the Inspectorate notes the shared land interests that exist within the Proposed Development site boundary, i.e with the proposed Lower Thames Crossing, Tilbury2 and Tilbury Energy Centre NSIPs (as illustrated on Figure 16 of the Scoping Report). The cumulative assessment should include all phases and elements of the Proposed Development and the other developments; and all relevant aspect assessment chapters. Particular consideration should be given to the cumulative impacts resulting from disturbance (including noise, traffic and light) to bird species associated with the South Thames Estuary and Marshes SSSI

ID	Ref	Other points	Inspectorate's comments
			and the Thames Estuary and Marsh SPA and Ramsar site. The relationship between the baseline year for the purposes of the cumulative assessment and the other developments that will be assessed should be clearly stated.
4.21.5	Paragraph 6.58	Zones of Influence (ZoI) for cumulative assessment	Paragraph 6.58 of the Scoping Report refers to developments '*in the immediate area of the Proposed Development'*, although a precise search/ study area is not defined. The ZoI for the Proposed Development should be clearly set out in the ES (a table format is recommended as per the Inspectorate's Advice Note Seventeen) in relation to each ES aspect topic.
4.21.6	Paragraph 6.61	Mitigation	The Inspectorate welcomes the Applicant's intention to work with the applicants of other developments to consider mitigation requirements or opportunities provided by some or all of these developments in conjunction. The ES should consider the interaction between mitigation measures proposed in respect of the different projects. Any efforts to co-ordinate mitigation strategies (across the adjacent development sites) should be described in the ES; but it must be clear who is responsible for delivery of any such strategy and how this would be secured.

5. INFORMATION SOURCES

5.0.1 The Inspectorate's National Infrastructure Planning website includes links to a range of advice regarding the making of applications and environmental procedures, these include:

- Pre-application prospectus[17]
- Planning Inspectorate advice notes[18]:
  - Advice Note Three: EIA Notification and Consultation;
  - Advice Note Four: Section 52: Obtaining information about interests in land (Planning Act 2008);
  - Advice Note Five: Section 53: Rights of Entry (Planning Act 2008);
  - Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements;
  - Advice Note Nine: Using the 'Rochdale Envelope';
  - Advice Note Ten: Habitat Regulations Assessment relevant to nationally significant infrastructure projects (includes discussion of Evidence Plan process);
  - Advice Note Twelve: Transboundary Impacts;
  - Advice Note Seventeen: Cumulative Effects Assessment; and
  - Advice Note Eighteen: The Water Framework Directive.

5.0.2 Applicants are also advised to review the list of information required to be submitted within an application for Development as set out in The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009.

[17] The Planning Inspectorate's pre-application services for applicants. Available from: https://infrastructure.planninginspectorate.gov.uk/application-process/pre-application-service-for-applicants/

[18] The Planning Inspectorate's series of advice notes in relation to the Planning Act 2008 process. Available from: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

APPENDIX 1: CONSULTATION BODIES FORMALLY CONSULTED

TABLE A1: PRESCRIBED CONSULTATION BODIES[19]

SCHEDULE 1 DESCRIPTION	ORGANISATION
The Health and Safety Executive	The Health and Safety Executive
The National Health Service Commissioning Board	NHS England
The relevant Clinical Commissioning Group	Thurrock Clinical Commissioning Group
Natural England	Natural England
The Historic Buildings and Monuments Commission for England	Historic England
The relevant fire and rescue authority	Essex County Fire and Rescue Service
The relevant police and crime commissioner	Essex Police and Crime Commissioner
The Environment Agency	The Environment Agency
The Maritime and Coastguard Agency	The Maritime and Coastguard Agency
The Marine Management Organisation	Marine Management Organisation
The Civil Aviation Authority	The Civil Aviation Authority
The Relevant Highways Authority	Thurrock Council
The relevant strategic highways company	Highways England
Transport for London	Transport for London
Trinity House	Trinity House

[19] Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (the 'APFP Regulations')

SCHEDULE 1 DESCRIPTION	ORGANISATION
Public Health England, an executive agency of the Department of Health	Public Health England
Relevant statutory undertakers	See Table 2 below
The Crown Estate Commissioners	The Crown Estate
The Forestry Commission	Forestry Commission
The Secretary of State for Defence	Ministry of Defence

TABLE A2: RELEVANT STATUTORY UNDERTAKERS[20]

STATUTORY UNDERTAKER	ORGANISATION
The relevant Clinical Commissioning Group	Thurrock Clinical Commissioning Group
The National Health Service Commissioning Board	NHS England
The relevant NHS Trust	East of England Ambulance Service NHS Trust
Railways	Network Rail Infrastructure Ltd
	Highways England Historical Railways Estate
Road Transport	Transport for London
Dock and Harbour authority	Port of London Authority
	Forth Ports (Port of Tilbury)
Lighthouse	Trinity House
Civil Aviation Authority	Civil Aviation Authority
Licence Holder (Chapter 1 Of Part 1 Of Transport Act 2000)	NATS En-Route Safeguarding
Universal Service Provider	Royal Mail Group
Homes and Communities Agency	Homes England
The Environment Agency	Environment Agency
The relevant water and sewage undertaker	Affinity Water
	Anglian Water
	Essex and Suffolk Water

[20] 'Statutory Undertaker' is defined in the APFP Regulations as having the same meaning as in Section 127 of the Planning Act 2008 (PA2008)

STATUTORY UNDERTAKER	ORGANISATION
The relevant public gas transporter	Cadent Gas Limited
	Energetics Gas Limited
	Energy Assets Pipelines Limited
	ES Pipelines Ltd
	ESP Connections Ltd
	ESP Networks Ltd
	ESP Pipelines Ltd
	Fulcrum Pipelines Limited
	GTC Pipelines Limited
	Independent Pipelines Limited
	Indigo Pipelines Limited
	Quadrant Pipelines Limited
	National Grid Gas Plc
	Scotland Gas Networks Plc
	Southern Gas Networks Plc
The relevant electricity generator with CPO Powers	RWE Generation UK Plc
The relevant electricity distributor with CPO Powers	Energetics Electricity Limited
	Energy Assets Networks Limited
	Energy Assets Power Networks Limited
	ESP Electricity Limited
	Fulcrum Electricity Assets Limited
	G2 Energy IDNO Limited
	Harlaxton Energy Networks Limited
	Independent Power Networks Limited

STATUTORY UNDERTAKER	ORGANISATION
	Leep Electricity Networks Limited
	Murphy Power Distribution Limited
	The Electricity Network Company Limited
	UK Power Distribution Limited
	Utility Assets Limited
	Vattenfall Networks Limited
	UK Power Networks Limited
The relevant electricity transmitter with CPO Powers	National Grid Electricity Transmission Plc

TABLE A3: SECTION 43 CONSULTEES (FOR THE PURPOSES OF SECTION 42(1)(B))[21]

LOCAL AUTHORITY[22]
Thurrock Council
Brentwood Borough Council
Basildon Council
Gravesham Borough Council
Dartford Borough Council
Castle Point Borough Council
London Borough of Havering
London Borough of Bexley
Medway Council
Essex County Council
Kent County Council

THE GREATER LONDON AUTHORITY

ORGANISATION
The Greater London Authority

TABLE A4: NON-PRESCRIBED CONSULTATION BODIES

ORGANISATION
Royal National Lifeboat Institution

[21] Sections 43 and 42(B) of the PA2008

[22] As defined in Section 43(3) of the PA2008

APPENDIX 2: RESPONDENTS TO CONSULTATION AND COPIES OF REPLIES

Consultation bodies who replied by the statutory deadline:

Castle Point Borough Council
Civil Aviation Authority
Environment Agency
ESP Utilities Group
Essex County Council
Essex Fire and Rescue
Forestry Commission
Gravesham Borough Council
Health and Safety Executive
Highways England
Historic England
Marine Management Organisation
Maritime and Coastguard Agency
NATS En-Route Safeguarding
Natural England
National Grid Electricity Transmission
Port of London Authority
Port of Tilbury
Public Health England
Royal Mail
Thurrock Council
Trinity House

Head of Regeneration and Neighbourhoods
Castle Point Borough Council
Council Offices, Kiln Road,
Thundersley, Benfleet,
Essex SS7 1TF
Tel: 01268 882200
Fax: 01268 882455

Date: 23.08.2018
Your Reference: EN010092-000018
Our Reference: 18/0728/CON

Ms E. Cottam
Major Casework Directorate
Temple Quay House
2 The Square
Bristol
BS1 6PN

Email: ThurrockFPG@pins.gsi.gov.uk

Dear Ms Cottam

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations) – Regulations 10 and 11

Application by Thurrock Power Ltd (the Applicant) for an Order granting Development Consent for the Thurrock Flexible Generation Plant (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

I refer to your consultation on, and notification of, the above proposal.

I would advise that this Authority has no comment at this time.

Yours sincerely

[redacted]

Kim Fisher-Bright
Strategic Development Officer

From: Jiggins Craig [mailto:Craig.Jiggins@caa.co.uk]
Sent: 28 August 2018 11:24
To: Cottam, Emma
Subject: EN010092 - Thurrock Flexible Generation Plant - EIA Scoping Notification and Consultation
Importance: High

Dear Emma

Thank you for sight of the EIA Scoping Notification and Consultation for the proposed Thurrock Flexible Generation Plant.

Whilst I agree with the report on aviation that there is no perceived significant effects to aviation given the distance from the closest airports and also with the presence of taller structures in the close vicinity, I do offer the following guidance:

- I would recommend that London City airport is advised of this proposal: London City Airport Ltd, Royal Docks, Silvertown, London, E16 2PX 020-7646 0000

- I would recommend that London Westland Heliport is advised of this proposal: London Heliport, Lombard Road, Battersea, London, SW11 3BE 020-7228 0181

- Please note the following guidance in relation to cranes: Crane Operations Cranes, whether in situ temporarily or long term are captured by the points heighted above. Note that if a crane is located on top of another structure, it is the overall hgt (structure + crane) than is relevant. Temporary structures such as cranes can be notified through the means of a Notice to Airmen (NOTAM). If above a hgt of 300ft (91.4m) above ground level, the developer must ensure that the crane operator contacts the CAA's Airspace Regulation (AR) section on ARops@caa.co.uk or 02074536599.
- If the crane is to be in place for in excess of 90 days it should be considered a permanent structure and will need to be notified as such: to that end the developer should also contact the DGC (see above). Additionally, any crane of a hgt of 60m or more will need to be equipped with aviation warning lighting in line with CAA guidance concerning crane operations which is again available at http://publicapps.caa.co.uk/docs/33/CAP%201096%20In%20Focus%20-%20Crane%20Ops.pdf

- Due to the unique nature of operations in respect of altitudes and potentially unusual landing sites, it would be sensible for you to establish the related viewpoints of local emergency services Air Support Units through the National Police Air Service (NPAS) organisation via email npas.obstructions@npas.pnn.police.uk;

- Due to the unique nature of operations in respect of altitudes and potentially unusual landing sites, it would be sensible for you to establish the related viewpoints of local emergency services Air Support Units through the relevant Air Ambulance Units - https://associationofairambulances.co.uk/member/london-ambulance-service-nhs-trust/

Should you have any further planning applications that you feel the CAA should be aware of, could I ask that they are sent to:

Airspace.policy@caa.co.uk

Regards

Craig
Craig Jiggins
ATM Technical Specialist
Safety and Airspace Regulation Group (SARG) - Airspace Regulation
Civil Aviation Authority

020-7453 6559

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Ms. Emma Cottam
National Planning Inspectorate
Temple Quay House 2 (The Square)
Temple Quay
BRISTOL
BS1 6PN

Our ref: AE/2018/123138/01-L01
Your ref: *

Date: 5 September 2018

Dear Ms. Cottam

EIA SCOPING - THURROCK FLEXIBLE GENERATION PLANT. LAND TO THE NORTH OF FORMER TILBURY POWER STATION

Thank you for your consultation dated 10 August 2018. We have reviewed the Environmental Impact Assessment – scoping report produced by RPS for the Thurrock Flexible Generation Plant, dated July 2018. Our response contains comments in relation to Flood Risk, Environmental Permitting in relation to flood risk activities, The Thames Estuary 2100 plan, the Future Thames Flood Barrier, Water Quality, Ecology, Fisheries, Contaminated Land, Waste and Environmental Permitting.

Flood Risk

The EIA scoping report (section Water Resources and Flood Risk pages 103-107) highlights that a Flood Risk Assessment (FRA) is required and will consider risks to the proposed development from flooding as well as the potential for the proposed development to increase flood risk elsewhere.

The required FRA will need to assess the actual and residual tidal flood risk to the site over the development lifetime – taking into consideration the impacts of climate change on sea levels (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances).

A breach assessment will need to be undertaken and the FRA will need to include details of appropriate mitigation measures for the proposed development. The NPPF PPG states that 'In Flood Zone 3a Essential Infrastructure should be designed and constructed to remain operational and safe in times of flood'. The FRA will need to determine what measures are required to ensure the safety of the development, and the Planning Authority will need to ensure that the measures proposed are acceptable and appropriate.

This assessment should be based upon the existing Thurrock Council Strategic Flood Risk Assessment (SFRA), in particular the Level 2 report which considers the residual tidal flood risk due to breach of the tidal defences but also by taking into account the redevelopment of nearby sites. The SFRA and supporting appendices are available via https://www.thurrock.gov.uk/planning-policy-evidence-and-supporting-documents/evidence-and-supporting-documents. This assessment of residual risk is essential to demonstrating that this proposal is safe for its design life and does not increase tidal flood risk offsite. It is important to ensure that the development proposal will not impede or divert flood waters and that it maintains flood storage. The tidal breach is a residual risk but the strategic layout of the site, based upon breach characteristics and the provision of suitable refuge, is essential in ensuring a reduction in impact if a breach occured. The key characteristics to consider for the specific breach are depth, inundation time and hazard transition characteristics across the entire development site.

Whether any mitigation for the offsite impacts is required may depend on the scale of the impacts to properties. The FRA should include information on the actual depth of flooding to the third party receptors, both currently and with the proposed works, as well as the increase in flood depths. The FRA should also show whether the works would cause any properties to be at risk of flooding in a breach that are not currently at risk. This may require topographic threshold surveys to be undertaken. If the proposed works would cause additional properties to flood, increase the hazard to people, or alter the property-level flood mitigation measures that can be implemented, then the FRA may need to mitigate these impacts. The FRA should detail whether mitigation would be possible, and what will be included as part of the application. The Planning Inspectorate will need to determine whether the proposed resulting offsite impacts are acceptable.

A Flood Response Plan (FRP) will be required for the proposed development. The FRP should account for all sources of flooding experienced at the site with the correct actions specified for the given inundation time. It should be drawn up in close liaison with Thurrock Council's Emergency Planner, the Emergency Services and us to ensure it includes appropriate actions related to potential site circumstance and that it is compliant with the wider emergency plans for the District.

Environmental Permitting Regulations 2016

A Flood Risk Activity Permit will be required for any works in, under, over or within 8 metres (m) from a fluvial main river and 16m from a tidal main river and from any flood defence structure.

Application forms and further information can be found at: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits. Anyone carrying out these activities without a permit where one is required, is breaking the law.

The scoping document proposes that once through water cooling could be incorporated into the scheme, we would welcome the opportunity to discuss with the applicant, how this would interact with flood defences on the River Thames.

Thames Estuary 2100 Plan / TEAM2100

We welcome the acknowledgement of the Thames Estuary 2100 Plan (the Plan) within section 8.145 of the EIA scoping report and the proposed capital works on the tidal defences associated with the Plan.

Cont/d..

A point to clarify in section 8.145 is that we have permissive powers available to us via section 165 of the Water Resources Act 1991 as amended by the Floods and Water Management Act 2010 which allow us to maintain and improve existing works as well as to construct new works on a designated main river watercourse or tidal flood defence. Our powers are permissive in respect of the duty upon the land owner thus there is no legal requirement on us to exercise these permissive powers to any given standard, or at all.

The Plan provides a vision for improving the tidal flood defence system for the period to 2100 so that current standards of flood protection are maintained or improved for most of the estuary taking account of sea level rise. TE2100 recommends actions that we and others will need to take in the short, medium and long term. The plan is based on contemporary understanding of predicted climate change, but is designed to be adaptable to changes in predictions (including for sea level rise) throughout the century.

Our Thames Estuary Asset Management (TEAM) 2100 programme is delivering the first 10 years of capital maintenance works recommended by the Plan. TEAM2100 programme pioneers a new asset management approach to ensure that the 300km of tidal walls, embankments and barriers along the Thames Estuary continue to protect 1.3 million people and £275 billion of property. The programme is being delivered jointly by ourselves, CH2M and Balfour Beattie, along with other suppliers. The programme is the UK's largest single flood risk programme of works, worth over £300m, and one of the government's top 40 major infrastructure projects. This programme includes completing detailed engineering investigations of tidal assets, and carrying out the necessary repairs or refurbishment works to ensure we maintain the current tidal flood risk on the estuary.

The flood defences providing benefit to the proposed Tilbury Flexible Generation Plant site, section 8.148, are currently considered to be below required condition, and are graded as condition grade 5. Our TEAM 2100 programme has assessed these defences as requiring significant remedial works or replacement within 5 years. The government is contributing funding towards the first 10 years of investigating, refurbishing and repairing assets in the estuary. As part of Defra's Flood and Coastal Resilience Partnership funding policy, we need to find the remaining 15% of funding from those who benefit from these assets.

We note section 8.161 acknowledges the need for the required flood risk assessment (FRA) to consider the future baseline environment to inform any further mitigation measures for the proposed development. The TE2100 preferred policy for the tidal defences benefitting the site is to maintain the current standard of protection over the next 100 years, keeping pace with climate change (based upon current sea level rise projections). Current aspirations under the Plan are to raise defence crest levels from 2036-2040, a timescale which aligns with the design life of the proposed development stated within section 3.40. We are looking to work in partnership with beneficiaries throughout the Thames Estuary, to explore potential contribution options.

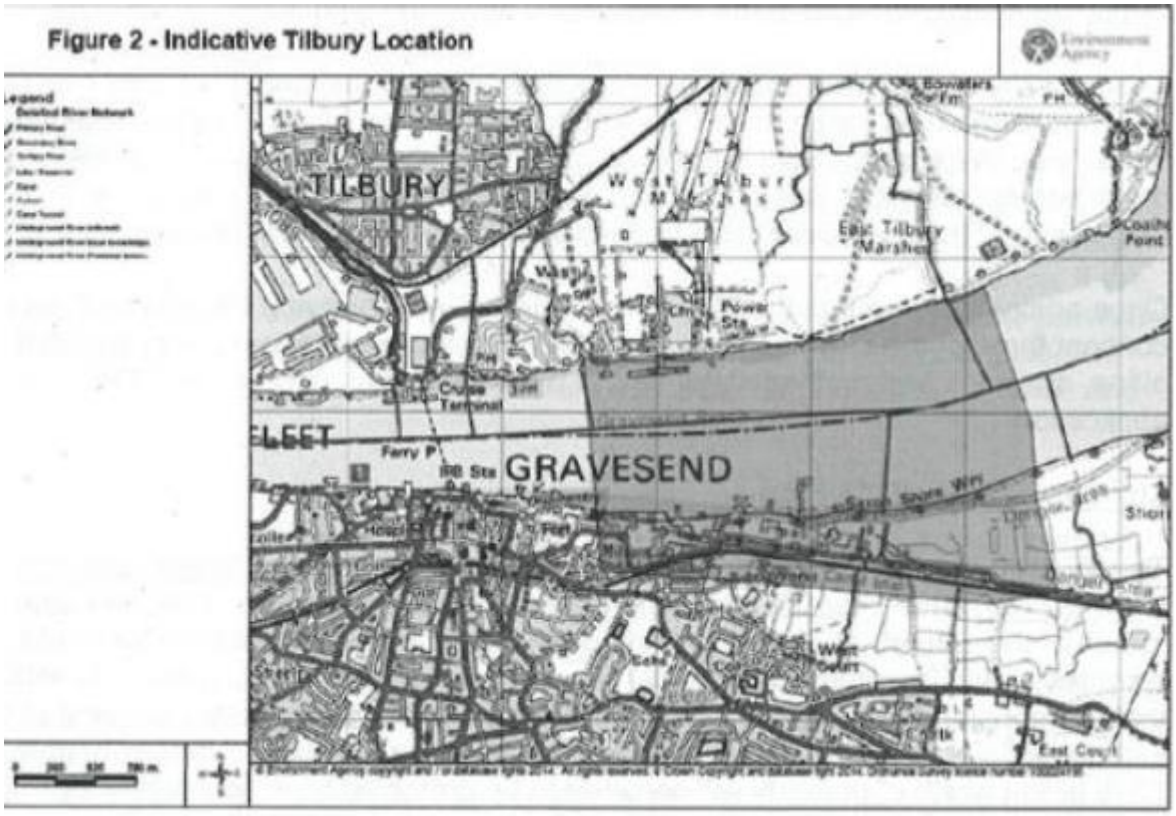
Therefore, we would welcome further strategic conversation with the applicant to explore how we can work in partnership to determine the most cost-effective means of delivering the required repairs to these assets as part of our TEAM2100 programme and the longer-term Plan defence crest level raising aspirations. Contributing to this programme of works means investing in flood defences which will protect the people, property and key infrastructure, including the applicant's site and gas pipeline distribution infrastructure, at risk in the Thames Estuary for the coming 40 years and beyond.

Cont/d..

Future Thames Flood Barrier

The scoping report indicates that the completed development will be designed to operate for at least 35 years, after which its operation will be reviewed, at this stage if the continuing use of the plant is not viable, it will be decommissioned. Based on this information it is possible that there could be a conflict of land use between the plant and a future barrier at the site.

To manage increasing water levels across the estuary beyond 2070 our TE2100 Plan has explored, assessed and appraised many options, and have determined two 'front-runners' based upon today's understanding of the estuary and climate change. Chapter 9 of the Plan currently recommends the adaptation of the existing Thames Barrier and to raise all existing defences downstream (TE2100 Plan Option 1.4) as the optimum approach for the next 60 years. We currently anticipate that a new arrangement for tidal defences in the Thames estuary may be required by 2070. Given the anticipated long lead in-time and current sea level rise projections, a decision on that new arrangement would be required in 2050. The plan suggests that one possible new arrangement would be the construction of a new barrier further downstream (Option 3.0). Any future barrier would need to come into operation around 2070. We know that it would be possible to adapt the Thames barrier and the associated defences to last through to the end of the century, but, when looking at the economics and the need to keep a high reliability in the system, it may prove more beneficial to construct a new Barrier downstream and four potential frontages for a replacement barrier have been identified. Of these four frontages, two are located on the Thurrock stretch of the Thames –Tilbury (Option 3.1 – shown in the plan below) and Long Reach, Purfleet (Option 3.2). Of these two frontages, the Long Reach, Purfleet is considered by the TE2100 plan as the preferred frontage.



Selection of sites for barriers for flood management within the identified frontages can be made only as part of a wide appraisal of alternatives for achieving the desired levels of protection. However the following local factors are to be considered in identifying possible sites:

- Location where navigation is not impeded, preferably on a straight length of navigation channel and with minimum cross currents and cross winds
- Avoiding existing urban or industrial infrastructure
- Minimising effects on the existing river
- Sheltered locations for gates, locks and navigation openings to avoid excessive wave loadings
- Access routes to site for construction and maintenance
- Acceptable foundation conditions
- Availability

We have commissioned our TEAM2100 project team to undertake a desktop-study to further refine the candidate barrier locations within the four frontages considered within the TE2100 plan. Emerging draft indications from our latest project work suggests that the western extent of the Tilbury frontage would be suitable to deliver a new barrier. This is due to several factors akin to those listed above including that the river is marginally narrower, it won't coincide with the Lower Thames Crossing (discussions have taken place with the Department for Transport) and that geotechnical conditions are more favourable. Large areas of land will be required for any new barriers, and therefore we are looking to safeguard land where opportunities present themselves along these candidate frontages as we currently do not have confirmation that any future barrier could definitely be delivered on the others sites. Pending the final outcomes of the desktop study referred to above:

- It is currently anticipated that the land requirements will be similar to the existing Thames Barrier, with a larger area on one side of the estuary and a smaller area on the other.
- For any proposed barrier along the Tilbury reach, the larger area would be on the southern bank (Gravesend area), for the principal reason being that the main control tower and other facilities are close to high ground.
- As a means of comparison the current Thames Barrier operational footprint similar to what may be anticipated on the northern(Tilbury) bank is 0.46ha. The construction footprint for the previous Thames Barrier was 9.25ha, although it is anticipated that 6ha of land would be required to construct a future barrier.

We would therefore expect to see consideration given to how the TE2100 plan requirements can be taken into account as part of this proposal. Given the proposed nature of the application the impact of a future barrier maybe minimal, but we would welcome further discussions on how to incorporate space for any potential future barrier within the proposals. We are unlikely to have any construction or operational need over land along this frontage for over 40 years. We acknowledge that the proposed lifespan of the development and so this may not be an issue however we would be pleased to provide any further information you may require from us to help facilitate our aspirations under the TE2100 plan.

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Water Quality

We believe Water Framework Directive (WFD) risk assessments should be a standalone chapter within the EIA/ES, containing all relevant supporting detail, not simply references to other parts of the ES. The evidence presented in a WFD assessment needs to be an integral part of the WFD document.

The criteria for assessment of certain WFD elements is not amenable to the "high level" significance analysis used for the EIA, since WFD qualifying elements have very well defined criteria: waterborne chemicals are assessed based on concentrations and the annual average and /or maximum allowable concentrations prescribed in WFD or its daughter directive the Environmental Quality Standards Directive (EQSD). All construction (not simply dredging) in marine waters which would ordinarily require a marine licence will require a valid WFD assessment.

Activities which may lead to the disturbance of marine sediments during construction will need to determine how much sediment may be re-suspended, and over what timeframe, whether those sediments contain contaminants covered by WFD /EQSD concentration limits for water, and if the amounts of sediment are significant, then we may require chemical analyses (to CEFAS equivalent standards, for a suite of chemicals which we will advise)to be undertaken so that full impact assessment can be underpinned by the appropriate chemical data. For construction activities, chemical analysis may not be required if we satisfied that the volumes of sediment being disturbed are too small to present a significant risk to water quality based on our judgement and experience of historic sediment data collected within the Thames estuary.

We provide web-based guidance for WFD risk assessment to cover the scoping of WFD risks, but impact assessment (the next stage in assessment for elements scoped in) of WFD risks is too complex to provide generic advice, and must be considered in the specific context e.g the waterbody's baseline concentrations, time of year, tidal state(s), and the adjoining waterbodies. We suggest the applicant engages in dialogue with us before attempting to undertake impact assessment for water quality, in order to agree the levels of detail required and avoid unnecessary costs of conducting sediment analysis where we may not require it.

The report indicates that the proposal seeks to scope out saltmarsh, fish and biocide assessment, we believe that these cannot be scoped out as they need to be considered (at scoping stage at least) for WFD. We note that paragraph 8.113 references the possibility of removing biocide from the project and this is not consistent with the intention to scope out the assessment of biocides from the outset. It implies there is an intention to use biocides and these should be assessed, including detailed impact assessment within WFD water quality section if the biocide is a controlled substance under EQSD/WFD. It will also need to be considered under any permitting regime required for the discharge into controlled waters.

We would welcome further clarification relating to the number of water quality surveys that are detailed in table 8.6 of the scoping report. The table indicates that spot samples will be taken every three months but given potential for change in a single tide, we feel this may not provide useful data in relation to WFD. We feel that a sample regime of sampling at 4 sites x 1 sample per month may be useful for WFD baseline data, and the AQMS station at Purfleet may provide continuous temperature, dissolved oxygen and conductivity data (which can be used to infer salinity regime).

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Should the applicant decide to use once through cooling water in their project design they will need to consider thermal modelling. This will underpin the assessment of water quality, both for water quality influences, in isolation, by the thermal plume and for any in-combination assessments. We have provided the applicant with further information in regards to thermal modelling as a technical appendix at the end of this letter.

Ecology

The scoping report identifies a mosaic of habitats associated with the site. The main issues that should be considered are:

- Impact on statutory designated sites (SSSIs, SPAs)
- Impact on non-statutory sites (Local Wildlife Sites)
- Protected species, particularly water voles and great crested newts
- Water Framework Directive, particularly any effects on terrestrial watercourses/ditches
- Impacts on fish and eels in ditches also need to be considered and surveys undertaken
- Invasive species. If any are present then eradication measures will be required.
- Invertebrate populations. The site is likely to have a significant assemblage of scarce brownfield invertebrates. This will need detailed surveys and adequate mitigation/compensation measures such as compensatory ditches and wetland.

The developer should adequately incorporate mitigation measures to offset the impacts on receptors during construction and operation. Where mitigation is not possible, then significant compensation will be required, off-site if necessary. We would like to see incorporation of wildlife friendly SuDs and green roofs in the development where possible, as these offer an opportunity to provide net gains in regards to biodiversity.

We note in section 3.35 the applicant indicates that they may consider the use of barge delivery for bulk materials such as aggregates utilising an existing jetty. The impacts of the jetty should be taken into account if the permission for this development and its implementation were to go beyond August 2022, when the current permission for the jetty expires. The jetty was agreed on a temporary basis on the understanding that it would be removed, and therefore no permanent mitigation for the impacts of its construction were included. Section 3.35 also indicates a larger jetty and pontoon could be constructed, such an undertaking would need to demonstrate that there would be no adverse impact on marine ecology and where appropriate propose mitigation measures to limit any impact.

Saltmarsh can only be scoped out on the understanding that no saltmarsh (including upper saltmarsh species) are present in the River Thames corridor. Rather than scoping out a particular habitat type, the assessment should just state that it will scope in all habitats within the zone of influence of the development.

The outfall and intake at the River Thames will need to assess the impact of scour or any required maintenance on the inter-tidal habitats that exist. Assessments should conclude whether there are any physical impacts that will lead to a net loss of any habitat as a result.

Fisheries

The scoping report highlights the potential impact on fish. We note that paragraph 8.113 indicates the use of passive wedge wire cylinder screening in the cooling intake

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to reduce the potential impacts on entrainment and impingement. The installed screens should constitute best practice protection for juvenile eels (glass eels and elvers). We would welcome the opportunity to work with the developer to assist them in the development of appropriate fish screens and look forward to reviewing the fish entrainment modelling. We note that thermal plume modelling is proposed and this should consider the impact on marine ecology including fish.

Whilst the report indicates that the use of the existing jetty is not considered to have the potential for a significant impact on the aquatic environment, we are aware of a number of other developments in the area which cumulatively have an impact. When undertaking assessments including construction plans, we feel the developer should consider the in-combination effect on the marine ecology, this would also be a requirement for a Environmental Permit application.

Contaminated Land

There are two historical (not permitted) sites that lie adjacent to areas proposed for the development. Princess Margaret Road Landfill (Love Lane) NGR 568171 177668 had wastes deposited between 1934 and 1988. Our records describe the wastes as Inert, Industrial and Commercial, but we have no more detailed information. Low Street Brickworks NGR 567238 177705 was operational between 1956 and1977 and our records indicate Industrial and Commercial wastes were deposited. We do not have any further information, but the developer should be aware of their existence and the possibility of contaminant migration into ground proposed for development. The Local Authority may have more information regarding these landfills.

The potential route for the cooling water pipeline and the intake/discharge point lies over previously landfilled areas for which there are existing permits. The east/west route (northern section) passes over part of the Tilbury Ash Disposal Landfill Site. This has a permit for Non-hazardous waste disposal.

The north/south section of the route crosses Goshams Farm (East Tilbury Marshes) Landfill Site. Our records indicate that household wastes were deposited, although waste deposit ceased in 1958 (we have no start date). But it has recently been subject to importation of material for the purposes of restoration, which is close to, or has recently been completed. It currently has a permit for the deposit of wastes for recovery. The developer should be aware that trenching works for any pipeline could extend into the wastes deposited. Site investigations, risk assessment, options appraisal and the development of remedial/mitigating strategies should be carried out. This is particularly the case with Goshams Farm Landfill Site, due to the age and the lack of reliable information with respect to early deposits. The possibility of unexpected waste types and extent should be recognised.

The route also includes a section of the Thames foreshore and extends eastwards towards East Tilbury Landfill. This site accepted, between 1979 and 1991, both solid and liquid wastes that would be classified as hazardous today. The possibility of contaminant migration from this site should be considered. As there are two currently permitted sites, our National Permitting Service should be consulted with regards to any possible implications of development on such sites.

We note that under the section ‘Geology, Hydrogeology and Land Contamination’, there is no mention of the need for groundwater abstraction or dewatering. If there is a requirement for either activity, we should be consulted at the earliest convenience, particularly if the applicant is looking to dis-apply Section 24 of the WRA in the DCO

application..

The WFD groundwater body underlying the site is South Essex Thurrock Chalk, this is currently at poor status (High Confidence) and we are not currently licensing any new consumptive abstraction from that groundwater body. WFD does not allow the overlying secondary aquifers to be differentiated from the Chalk.

As of January this year dewatering became a licensable activity as a New Authorisation. If dewatering is required i.e. for construction purposes, we would expect the EIA to assess the potential impact from dewatering on surface water features, ecology and other water users. The potential for abstraction of historical contaminated groundwater and/or mobilisation of contaminants should also be considered.

Waste

All construction work creates waste, some can be reused on site and some will be removed from site. CL:aire guidance should be followed if soils movement is required and an acceptable receiving site can be found. If any waste is to be used on site to build roadways or other structures, then a permit or an exemption may be required and a deployment of mobile treatment may be required. The developer should note that tonnages of waste used apply to permits and exemptions. The applicant should design their scheme to minimise the generation of waste and consumption of raw materials.

Environmental Permitting

An environmental permit is required from us for this project before the commencement of operations, under the Environmental Permitting (England and Wales) Regulations 2018 (EPR) (as amended) as a Section 1.1 Combustion Activity.

We recommend parallel tracking the DCO and permit applications for this project which provides the opportunity to identify any key issues of concern and to enable these to achieve a timely resolution. Should twin tracking not be progressed then we would recommend early discussions with the applicant prior to the submission of the Environmental Permit Application. Further detail on pre-application can be found at:

https://www.gov.uk/government/publications/environmental-permit-pre-application-advice-form

Detailed design for the proposed development has not been completed and as such there is currently not sufficient information within the scoping document to comment further on specific environmental permitting aspects, however we outline general points with respect to permitting below. We submit these without prejudice to the determination of the Environmental Permit Application:

During permit determination the applicant is required to consider Best Available Techniques (BAT) in order to avoid or reduce emissions resulting from installations. Additionally, the applicant is further required to consider the reduction of impacts on the environment as a whole. Specifically in this instance, this should include in-combination affects (for both air and water) with neighbouring proposed developments and the potential for these considerations to influence technology choice, whilst achieving BAT.

Further information on permitting is available on www.gov.uk at:

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http://www.gov.uk./topic/environmental-mangement/environmental-permits.

Air Quality

The scoping report does not provide the screening distance that has been selected for designated sites (i.e. SACs, SPA, RAMSAR and SSSI sites). It should be noted that for an Environmental Permit application 'Air emission risk assessment' guidance should be used to inform screening distances for designated sites. This can be found at: (https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#screening-for-protected-conservation-areas)

As noted within the scoping reports, the proposed development is located in close proximity to a number of Air Quality Management Areas (AQMAs) with the nearest, being located approximately 1.8km away. Detailed consideration of background (baseline) concentration levels in and outside these areas will be required and considered during the Environmental Permit application stage.

It is further noted that the applicant will undertake air quality modelling of air pollutants during the operation phase of the development, inclusive of cumulative impacts of neighbouring proposed developments, for the EIA submission. Air quality modelling will also be required from the developer as part of the Environmental Permit application.

The granting of planning permission does not automatically mean a development will receive an environmental permit, however, we are willing to work with the applicant both during the pre-application period and the examination period of the DCO to ensure that all permitting issues are addressed and any delays are avoided.

We trust this information is useful.

Yours sincerely

Mr. Pat Abbott
Planning Advisor

Direct dial 0208 4748011
Direct e-mail [redacted]

Technical Appendix – Thermal Modelling

The applicant should follow the advice below in regards to thermal modelling:-

Proposed Temperature Targets for the Assessment of Mixing Zones in Transitional and Coastal Waters

Peter Jonas, Senior Advisor – Marine, Water Quality, Environment Agency
17th January 2015
Karen Pehrson Edwards, Principal Marine Modelling & Planning Officer, RBMS, Environment Agency, February 2018

Introduction

Water quality targets are needed to assess the thermal impact of cooling waters from power stations on transitional and coastal (TraC) waters, and to determine environmental permits for discharges to such waters. This is a draft paper proposing temperature targets to define the mixing zones for thermal discharges to TraC waters. In relation to these targets, a mixing zone is defined as the part of a body of surface water which is adjacent to the point of discharge and within which the targets may be exceeded, provided that the environmental objectives of the Water Framework Directive are met within the water body as a whole. This definition reflects the working definition of a mixing zone provided within the CIS Guidance on Mixing Zones pursuant to Article 4(4) of the Directive 2008/105/EC (EC December 2010).

For rivers, there are Water Framework Directive (WFD) standards for water temperature, which are defined in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. These are given in Table 1 below.

Table 1. Temperature standards for rivers

Column 1	Column 2		Column 3		Column 4		Column 5	
	High		Good		Moderate		Poor	
River temp type	Non-cyprinid	Cyprinid	Non-cyprinid	Cyprinid	Non-cyprinid	Cyprinid	Non-cyprinid	Cyprinid
River temp (°C) as an annual 98-percentil	20	25	23	28	28	30	30	32

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e standard								
Increase (or decrease) in temp (°C) in relation to the ambient river temp, as an annual 98-percentile standard	2	2	3	3	-	-	-	-

Note to Table: The standards specified for temperature in the bottom row; Columns 2 and 3 of Table 1 must not be used for the purpose of classifying the status of bodies of surface water except where the water receives consented thermal discharges.

For TraC waters, there are no explicit WFD standards for temperature, although draft proposals were made by UKTAG in March 2008.

Regulatory Background

Water Framework Directive

Draft WFD standards were published by UKTAG in March 2008, which formed the basis for the WFD standards for rivers quoted in Table 1.

Table 2. Proposed boundaries for temperature (for rivers)

	Temperature (ºC) (Annual 98-percentiles)			
	High	**Good**	**Moderate**	**Poor**
Cold water	20	23	28	30
Warm water	25	28	30	32

It was stated concerning the maximum temperature values defined above for rivers, that:

“It is proposed that the values are not used for the classification of lakes, estuaries and coastal waters; but are to be used for these waters to calculate the action needed to achieve a target class, or for day-to-day operational control of discharges and abstractions. In the regulation of thermal discharges more specific locally derived

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background reference conditions may be required if the thresholds (above) are not appropriate."

An additional requirement of the draft standards was that, outside the mixing zone, a temperature uplift relative to background (ΔT) of 3ºC is allowable, except for waters of high ecological status where a 2°C uplift limit is proposed. In a footnote on page 26 of the UKTAG report, it was also proposed that these proposed uplift standards are the 98th percentile, or in other words, should not be exceeded for more than two per cent of the time.

Subsequent guidance from Defra in the River Basin Planning Guidance, Vol 2 (August 2008) included instruction for the Agency to comply, pending their formal adoption, with the draft UKTAG standards for temperature for rivers, lakes, estuaries and coastal waters in making regulatory decisions. This position was endorsed in Defra's River Basin Planning guidance issued in July 2014.

Habitats Directive

In addition to these proposed targets under WFD, there are existing temperature thresholds for assessing the impact of thermal discharges on European marine sites designated under the Habitats Directive (WGTAG Paper 160, January 2006). These are shown below in Table 3.

Table 3. Temperature thresholds for assessing the impact of thermal discharges on SAC/SPA sites in TraC waters

Designation	Deviation from ambient	Maximum temperature
SPA	2°C as a Maximum Allowable Concentration (MAC) at the edge of the mixing zone	28°C as a 98 percentile at the edge of the mixing zone
SAC (any designated for estuary or embayment habitat and/or salmonid species)	2°C as a MAC at the edge of the mixing zone	21.5°C as a 98 percentile at the edge of the mixing zone

Shellfish Waters Directive

There was also a guideline standard for temperature under the Shellfish Waters Directive. The standard stated that "A discharge affecting shellfish waters must not cause the temperature of the waters to exceed by more than 2°C the temperature of waters not so affected, for 75% of samples taken." This Directive was repealed in 2013. However, the Water Framework Directive must provide at least the same level of protection to shellfish waters (which the WFD classifies as protected areas) as the Shellfish Waters Directive did.

Proposed Temperature Targets for Mixing Zones in TraC waters

- Until there is better understanding of the impact on temperature and temperature change on the ecology of estuaries and coastal waters from thermal discharges, the Environment Agency will use the freshwater UKTAG (WFD) standards for 'Good'

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status for non-cyprinids to define the extent of the mixing zones for thermal discharges in TraC waters in relation to WFD requirements. There are separate mixing zones for the absolute temperature and the temperature uplift. These are:

- The water temperature at the edge of the allowed absolute temperature mixing zone shall not exceed an annual 98 percentile of 23^{o} Centigrade; and
- The water temperature uplift above ambient background water temperature outside the allowed water temperature uplift mixing zone shall not exceed 3^{o} Centigrade for more than two per cent of the year.

- It should be noted that, because many thermal discharges impact on intertidal areas, periods of exceedance of water temperature and/or water temperature uplift at intertidal locations are to be evaluated as occurring only when the location is immersed[1].
- Furthermore, in line with international good practice as outlined in the BEEMS Scientific Advisory Report Series 2011 no. 008 (Thermal standards for cooling water from new build nuclear power stations), it is also recommended that the mixing zone should not occupy more than 25% of the cross-sectional area of an estuarine channel as an annual 98 percentile.
- Where appropriate, other temperature standards will need to be considered in relation to conservation designations and specific conservation objectives, as indicated in Table 3, and other protected areas, such as shellfish waters. Additional standards may also be required for estuarine channels, where there may be the need to assess the potential for the plume to cause a thermal barrier to fish movements.

[1] The clarification in the note is important since the approach to modelling intertidal areas may differ from model to model. Some models may associate a temperature, temperature rise and indeed volume of water with a 'dry' location in order to manage the modelling of wetting and drying in a numerically stable way. It would be inappropriate for such temperature or temperature rise data to contribute to statistics of exceedance and therefore model output from periods when the cells are 'dry' should not be used. Moreover, instruments may be deployed on intertidal areas for monitoring purposes and these will record temperature continuously, regardless of whether the location is 'wet' or 'dry'. It would be inappropriate for data for periods when the instrument is 'dry' to contribute to statistics of exceedance. In practice such periods can easily be identified through consideration of water depth (pressure) or salinity data for the same instrument.

It should also be noted that, while the above temperature targets provide a useful indication of the extent of a mixing zone, consideration will continue to be given to the impact of an individual thermal discharge on the ecology of a water body to ensure that the objectives of the Water Framework Directive are met.

From: Mark Chapman [mailto:mark.chapman@espug.com]
Sent: 14 August 2018 10:46
To: Thurrock FPG
Subject: RE: EN010092 - Thurrock Flexible Generation Plant - EIA Scoping Notification and Consultation

Emma

Thank you for the email.

I can confirm, that as no ESP assets are located within the boundary of work, ESP do not have any comments to make at this time.

Many thanks.

Regards

Mark Chapman
Head of Network (Gas)

Direct line: 01372 587553
[redacted]

From: ESP Utilities Group Ltd [mailto:donotreply@espug.com]
Sent: 15 August 2018 14:56
To: Cottam, Emma
Subject: Your Reference: EN010092-000018 Our Reference: PE136854. Plant Not Affected Notice from ES Pipelines

Emma Cottam
The Planning Inspectorate

15 August 2018

Reference: EN010092-000018

Dear Sir/Madam,

Thank you for your recent plant enquiry at: (EN010092-000018).

I can confirm that ESP Gas Group Ltd has no gas or electricity apparatus in the vicinity of this site address and will not be affected by your proposed works.

ESP are continually laying new gas and electricity networks and this notification is valid for 90 days from the date of this letter. If your proposed works start after this period of time, please re-submit your enquiry.

Important Notice

Please be advised that any enquiries for ESP Connections Ltd, formerly known as British Gas Connections Ltd, should be sent directly to us at the address shown above or alternatively you can email us at: PlantResponses@espipelines.com

Yours faithfully,

Alan Slee
Operations Manager

UTILITIES GROUP
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http://www.espug.com

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Essex County Council

FAO Ms Emma Cottam
The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

Our Ref: ECC/TFGP/ScopingOpinion

Your Ref: EN010092-000018

Date: 6 September 2018

Sent by email: ThurrockFPG@pins.gsi.gov.uk

Dear Ms Cottam,

RE: Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11

Application by Thurrock Power Ltd (the Applicant) for an Order granting Development Consent for the Thurrock Flexible Generation Plant (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Thank you for the opportunity to respond on behalf of Essex County Council (ECC) as a neighbouring authority and statutory consultee on this Statutory Consultation on the Scoping Report to inform the Environmental Statement (ES) for the proposed development for the Thurrock Flexible Generation Plant.

ECC is a neighbouring and strategic authority within the definition of the Duty to Co-operate S110 of the Localism Act 2012 and Section 30 of the Planning and Compulsory Purchase Act 2008. The proposed Thurrock Flexible Generation Plant is a strategic cross-boundary matter and ECC wish to engage with this process, with the following relevant roles:

- A key partner and service provider within Essex promoting economic development, regeneration, infrastructure delivery and new development for the benefit of Essex and the region;
- The highways and transportation authority for Essex, with responsibility for the delivery of the Essex Local Transport Plan;
- The Minerals and Waste Planning Authority and Lead Local Flood Authority for Essex;
- The Public Health advisor for the county of Essex; and
- The Local Education Authority for Essex and as a key partner in the promotion of employability and skills.

Draft

ECC has a long history of close working with Thurrock Council, a neighbouring unitary authority within Greater Essex and as partner authorities in South Essex, within London Thames Gateway; South East Local Enterprise Partnership (SELEP) and the Opportunity South Essex Partnership (OSE). It will be necessary for Thurrock Power Ltd to have regard to the wider regional priorities, as set out by ECC, SELEP and OSE.

ECC wishes to engage with this ongoing process, to develop the Preliminary Environmental Information Report (PEIR) and inform the ES that will form part of the application for the Development Consent Order (DCO) application for the Thurrock Flexible Generation Plant.

ECC has identified a range of issues and comments regarding the Scoping Report, which require further clarification, additional information and actions to be incorporated within the ES. ECC's comments are outlined below.

ECC Comments by Service Area

The nature and scope of the consultation responses that follow concern:

- Highways and Transportation
- Minerals and Waste Planning
- Lead Local Flood Authority – Flood and Water Management
- Public Health and Wellbeing
- Economic Growth, Regeneration and Skills
- Historic Environment and Archaeology
- Landscape and
- Natural Environment

Highways and Transportation

ECC needs to be satisfied that any impacts on the strategic routes connectivity, capacity and resilience are addressed and potential benefits for the Essex economy are optimised. ECC requires further data and analysis on the wider strategic routes to:

- Identify the impact on Essex and surrounding areas;
- Understand employee access to and from the site, job numbers and expected modes of travel (including sustainable access and potential links with London Gateway);
- Evaluate the impact, with regard to TfL transport projects in the vicinity of the scheme and Essex;
- Establish the projected increase in traffic arising from the scheme and the cumulative impact of current planned growth (and transport projects) including those located within Greater Essex and in the east London boroughs adjoining Thurrock and Essex.

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- Establish the implications, sensitivity and inter-relationship on transport movements across the wider strategic network, including the Dartford crossing and the forthcoming Lower Thames Crossing (LTC).
- Understand the timescales for project delivery and the cumulative impacts and timing with other major transport infrastructure projects in the vicinity, be it the LTC, A13 road widening, A127/A130 Fairglen Interchange improvements, and the A127 route management strategy; and
- Understand the sustainable transport provision for employees and freight during both the construction and operational phases of the development. For example how will employees travel to the site?

ECC would expect these details and proposals to be addressed in the Transport Assessment (TA) Report.

LTC is a strategic transport NSIP project which is important to the UK as a whole and is supported by ECC. The road network connecting to the LTC is the responsibility of Highways England (HE). ECC would like to be reassured that both the construction and operational impacts of the proposed Thurrock Flexible Generation Plant on the construction and operation of the LTC have been fully considered. This equally applies any proposed new junction to support the Tilbury 2 NSIP scheme.

ECC seek confirmation from HE and Thurrock Power Ltd that these discussions have taken place, and that HE have no objections to the Thurrock Flexible Generation Plant.

Specific Comments

Paragraph 8.47 discusses operational traffic and should be re written to clearly state whether the applicant expects to prepare a TA for the operational phase, and the analysis they intend to undertake to assess the need for a TA. There is a reference to “scoping out an assessment” but this phrasing is vague and needs clarification. ECC considers that operational traffic should also be considered as there is the potential for impacts on the roads within the ECC highway network or be robustly demonstrated why it should be out of scope. It is not considered that there is sufficient evidence to scope operational traffic out at this stage.

Paragraph 8.48 notes that “consultation may also be required with ECC as a neighbouring highway authority”. This should be a requirement and should be re-written as “consultation will also be required with ECC as a neighbouring highway authority”. Based on the Scoping Report ECC would expect this to be a fairly straight forward process on the basis the applicant can provide data to demonstrate that the transport impact on the ECC network is negligible.

Paragraph 8.50 - cumulative impacts are important here. ECC will once again wish the applicant to demonstrate that they have agreed any impacts on the strategic road network and necessary mitigation with HE. Construction traffic routing, especially related to

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abnormal loads, will need to be assessed for its impact (if any) on the ECC network. Construction worker travel plan should consider sustainable modes and access for potential construction workers based in Greater Essex.
Paragraph 8.53 - ECC would like to see data to back up the proposal to remove operational traffic from the scope of the assessment.

In terms of mitigation measures, ECC recommends this include travel plans for construction workers and operational workers, and that such measures should seek to link with any mitigation measures proposed to be put in place for Tilbury 2 and the Tilbury Energy Centre Scheme, given the close proximity of the sites. ECC as neighbouring highway authority would wish to be consulted on all aspects relating to traffic movements and impact on the highway network including points above, along with workers travel planning etc.

Minerals and Waste Planning

ECC is a neighbouring Minerals Planning Authority and neighbouring Waste Planning Authority. ECC has no comments to make at this stage in relation to this EIA Scoping Report or the wider proposal.

Lead Local Flood Authority – Flood and Water Management

ECC is a neighbouring Lead Local Flood Authority (LLFA).

If a surface water drainage strategy is to be developed in discussions with the Environment Agency, ECC as a neighbouring LLFA and Risk Management Authority (RMA) should be included in these discussions. This should be clearly identified and the role that will be played should be transparent from the earliest opportunity.

Paragraph 8.158 - ECC as LLFA wishes to be consulted in relation to water quality.

The impact on groundwater and groundwater movement should be included in the assessments. The assessments should also consider infiltration potential.

Pluvial flood risk should be explicitly considered and be presented as a separate section of the ES. At present it appears to be focused on fluvial flood risk.

It is recommended that the ES refer to the Flood and Water Management Act, Land Drainage Act, and British Standards related to flooding, surface water and construction, and as a minimum.

Public Health and Wellbeing

ECC is the Public Health advisor in the two tier administrative area of Essex, and is the host authority in respect of the neighbouring authorities in Essex - Basildon, Brentwood,

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and Castle Point. ECC Public Health wishes to engage with this process in liaison with colleagues in Public Health England and Thurrock Unitary Authority Public Health advisors (including environmental health). The following comments are made.

It is strongly recommended that a health impact assessment is prepared as part of this proposal. The wider determinants of health, with reference to any potential socio-economic benefits, should be explored i.e. employment opportunities including during the construction phase of this project.

ECC would request that Environmental Health colleagues in Thurrock Unitary Authority and Public Health England are consulted so to ensure that the potential environmental impacts upon human health are addressed. It is strongly advised that the Public Health England Centre for Radiation, Chemicals and Environmental Hazards (CRCE), with their remit of human health protection, are advised of this scoping document and have the opportunity to advise on their inclusion requirements to the report and the subsequent planning application.

Public Health at ECC wishes to be engaged on the wider public health issues that are identified and may impact upon Essex residents. ECC anticipate engaging with Thurrock Unitary Authority Public Health team on these matters.

Economic Growth, Regeneration and Skills

Section 8.61 - Despite the report's statement that there is very little government guidance setting out preferred method for assessing potential socio-economic effect, there are common methods used in other settings which could be applied here.

Whilst this is an infrastructure proposal, it is recommended that the applicant considers the employment generation through the construction phase. In particular consideration should be given to datasets to quantify potential construction employment effects through the Construction Industry Training Board Labour Forecasting Tool.

Consideration should also be made to develop a supplementary planning document to develop a local employment legacy, skills and training needs for both the construction and operational phases. The construction phase could potentially see a number of skills pinch-points and early consideration and engagement is needed to address these skills and local labour challenges. This may include the need for investment in the local skills provision in order to address skills issues and develop a skills legacy.

This should be considered cumulatively with the other NSIP projects within the immediate vicinity of the proposed site, namely LTC, Tilbury 2 and the Tilbury Energy Centre, which will also generate significant requirements for local employment and development of construction and engineering skills across the area.

Historic Environment and Archaeology

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The Archaeology and Cultural Heritage section contains the information relating to the proposed assessment methodology of the historic environment impacts. It should be noted that the proposed development area is situated in a sensitive area of heritage assets situated between two scheduled coastal forts.
It is recommended that considering the impacts likely to be caused by this development to both the heritage assets and their settings including listed buildings, scheduled monument, conservation areas and archaeological deposits, the applicant should organise joint early discussions between Historic England, conservation officer and archaeological advisors in advance of their EIA assessment to ensure the work is being undertaken appropriately and covers all aspects that will be required to be assessed.

Considerable recent work has occurred within the area and all of this data will require reviewing and adding to the existing data held on the HER.

A field assessment is likely to be needed to understand potential land fill within the area and how this has impacted on the historic ground surface. Even if this has occurred then the historic creeks and field boundaries that survive are likely to contain surviving archaeological deposits.

Landscape

The approach and methodology set out for the Landscape and Visual Impact Assessment (LVIA) and included in the EIA Scoping Report gives a broad outline of the assessment process and aspects needed to assess the impact of the proposed development through the EIA process.

The non-technical summary correctly identifies the need to assess cumulative impacts arising from other national infrastructure projects and developments within this area.
There will be a need to consider the landscape and visual impacts associated with the development of land which may otherwise have provided an element of landscape mitigation for the proposed development of Tilbury 2 and the Energy Centre. The proposed location for the Thurrock Flexible Generation Plant is directly to the east of the DCO order limits for Tilbury 2 so this will impact on the scope for the marshes to offer wider landscape mitigation for this development.

<u>Specific Comments</u>

Paragraph 6.41 - The DCO boundary will need to incorporate all land where the primary landscape mitigation measures are proposed. The LVIA will need to identify how the proposal will impact upon the effectiveness of the proposed landscape mitigation strategy for Tilbury 2.

Paragraph 8.18 and 8.19 - Proposes 20 potential viewpoints with the exact location of representative viewpoints and photomontage ‘to be agreed with Thurrock Council’. Figure

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9 shows the proposed locations. These viewpoint locations appear to be limited in range and in terms of assessment of visual impacts. The final choice of viewpoints should be agreed with all the relevant local planning authorities.

Visual receptors should be considered in terms of their type for example residential, transport road/rail and recreational i.e. visitors to promoted sites, bridleway and footpath users. It is suggested that other areas where viewpoints need to be considered and identified are as follows:

- Fort Road, east of Tilbury (note VP 11 Tilbury 2)
- West Tilbury from the St James Churchyard, and from footpath 68
- West Tilbury from Church Road
- North of West Tilbury, from footpaths 67 and 63.
- Chadwell St Mary, south east side of settlement from footpaths
- East Tilbury, edge of new settlement extension and bridleway 58
- South of Station Road, footpath 200
- Coalhouse Fort, various locations including the car park
- Coalhouse Point and footpath 146, Two Forts Way

Figure 9.8 of the Tilbury 2 LVIA documentation also provides useful locations in relation to some of the areas.

Paragraph 8.20 - States that five visual representations will be provided. It is suggested that this seems rather limited given the range and scope of likely visual receptors with the zone of theoretical visibility. Once the assessment process has been undertaken it is likely that this will highlight the need for additional visual representations to be presented. Some viewpoint locations may also coincide with the Heritage receptor locations for example Coalhouse Fort and its setting.

Paragraph 8.21 - States that ‘mitigation measures will be considered as part of the iterative design process’. This statement appears rather weak. On this basis the following is recommend.

The potential landscape and visual impacts arising from this proposed NSIP development on the identified receptors, designated sites and adjacent landscapes will need to be assessed and identified. Proposals for appropriate landscape mitigation measures, to deal with the identified landscape and visual impacts will need to be set out in a Landscape Mitigation Strategy, in a similar manner to that proposed for Tilbury 2.

The strategy will need to identify additional landscape mitigation measures which are required to deal with the residual landscape and visual impacts arising from the development, and associated infrastructure. This is likely to include the need for off-site measures.

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Mitigation measures will need to be identified and these should be designed to accord with the key characteristics and qualities of the neighbouring landscape character areas. The Tilbury urban area, West Tilbury, Tilbury Marshes and Chadwell escarpment LCA areas are likely to experience the most significant visual impacts and measures to mitigate impacts and reinforce the landscape condition should be designed accordingly.

Where the identified landscape measures fall outside the DCO boundary line then specific agreements to ensure that works are secured, delivered (funded and implemented) and managed appropriately will need to be formulated.

It is suggested that a Landscape Mitigation Fund be set up and funded from the various major developments within the area and used to fund landscape mitigation projects and enable management measures/projects to be undertaken.

Arboriculture

Although the report references the fact there are trees on site, there does not appear to be any specific information provided on proposals for any arboricultural surveys.

For the size and scale of the proposals, it will be necessary to understand the constraints that the existing trees on site pose. In order to determine whether these trees will be suitable for retention or removal, a Tree Constraints survey should be carried out in line with British Standard 5837: 2012, detailing all trees within the red line boundary and within 15m of the site.

Trees that are categorised as either A or B do form a constraint on development. Any potential removals should be carefully considered and if removal is necessary, should be mitigated for within the Landscape Management Plan. Category C trees do not form a constraint on development.

Once details of site design have been progressed, it will be necessary to complete an Arboricultural Impact Assessment, Method Statement and Tree Protection Plan (as outlined in BS5837: 2012) as part of a full planning application. This will ensure any retained trees are suitably protected throughout development and any tree losses are mitigated for.

Natural Environment

This proposed NSIP is likely to result in indirect impacts on statutory designated sites both SPA and SSSI and direct impacts on several non-statutory designated sites, such as Local Wildlife Sites (LoWS).

For the most part, ECC is satisfied that nationally agreed guidelines have been followed for the ecology surveys, but please see the section specific comments below. All mitigation

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and compensation should take place within the red line boundary submitted for the DCO application.

The EIA should thoroughly explore all reasonable options to enhance the development for Protected and Priority species and habitats, and others of significance at a local level.

It is recommended that the HRA screening needs to identify which Impact Risk Zones (IRZs) the site falls within for Natura 2000 (N2K) sites identified by Natural England on MAGIC website for this type of development which may or may not be 10km. An assessment should also be made of SSSIs and LoWS (within 2km) and Marine Conservation Zones (rMCZ's).

The Shadow HRA needs to consider impact pathways for Likely Significant Effects (LSE) on the Thames Estuary and Marshes SPA/Ramsar and North Downs SAC from **the development alone or in-combination with other plans and projects** e.g. LTC, Tilbury2 and Tilbury Energy Centre – all NSIPs in the locality.

Where further ecological field work is required will be undertaken to ensure that up to date information is used as a basis for assessment, these should be supplemented by data from Essex Field Club and Essex Wildlife Trust to inform the survey requirements and ensure that Priority and Protected Species are considered adequately. Records from new or updated surveys undertaken should be shared with both records centres.

It is considered that the proposed structure for the ES should include a dedicated section on the Cumulative and In Combination in Impacts and Benefits, to provide a collective assessment of the Impacts/Benefits and any mitigation.

If you require further information or clarification on any points raised in this response please contact Graham Thomas or Anne Clitheroe, details set out below.

A fully detailed and specific Ecological Management Plan will be expected as part of the planning submission, focussed on national and local conservation priorities.

<u>Specific Comments</u>

Paragraph 8.86 - Reference to LoWS is limited to 1km from the main development site and states the presence of two such sites, but section 2.5 of the PEA in Appendix D shows that there are two LoWS within the red line boundary, a further five adjacent to it and 11 more within 2km. Direct and indirect impacts to all of these site s should be considered within the EcIA. These sites should also be considered for enhancement should compensation be required.

Figure 2 (Sheet1) - This figure gives the red line boundary for the development, which differs from the area covered by the PEA contained in Appendix D. Area K, as shown on this figure, crosses land known as Tilbury Ashfields, and will affect land already managed in mitigation for ecological impacts arising from an active planning consent there. Any

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cumulative impact on this site, which is of high significance for its invertebrate populations should be carefully assessed and substantial compensation for any impacts will be expected.

Appendix D - 2.1 - Biological records have been obtained from EWT's Biological Records Centre, but Essex Field Club also hold biological records including for invertebrates, which is likely to be a significant issue in this location and so data should also be obtained from them to inform the EIA.

Appendix D – 3.42 - Area K is described as improved grassland, but is actually part of the Tilbury Marshes Local Wildlife Site, recorded in the Site description as being relict grazing marsh with a "good grazing-marsh flora".

Appendix D – 3.45 - The evaluation of habitats plays down the status of some grassland areas as remnants of Coastal Grazing marsh, a Priority Habitat. Further detailed botanical survey is required to establish the plant communities present (Area K) and to properly evaluate its conservation value and potential for restoration or enhancement.

Appendix D – 4.2 - Only Area A has been subject to further botanical survey. As mentioned above, an appropriate botanical survey of Area K, which is proposed as planning gain land, should be carried out to establish its current character and condition in relation to its coastal grazing marsh origin.

Appendix D – 8.28 - Although not subject to a national conservation designation, it should be noted that the breeding pair of Raven represents the only known breeding site in Essex at the present time, and is therefore of high County – level significance. Compensation for the loss of the nest site should be considered.

If you have any queries regarding the information contained in this letter please do not hesitate to contact as below.

Yours sincerely

[redacted]

Enquiries to: Graham Thomas

[redacted]

or

Graham Thomas
Head of Planning & Development Service
Economies, Localities and Public Health

Matthew Jericho
Spatial Planning Manager

[redacted]

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Essex County
Fire & Rescue Service

Jo Turton
Chief Fire Officer / Chief Executive

Emma Cottam MRTPI
The Planning Inspectorate
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✉ southwestgroupsdp@essex-fire.gov.uk

Our Ref: CAS-627953
Your Ref: EN010092-000018
Date: 4th September, 20218

Dear Madam,

Re: Town & Country Planning Act 1990

Planning Application Nº.: EN010092-000018

Description: Application by Thurrock Power Ltd for an Order granting Development Consent for the Thurrock Flexible Generating Plant

Location: Immediately to the north of the existing Tilbury Substation and site of the decommissioned Tilbury coal fired power station, Fort Road, Tilbury. Part of the main development site is known as Walton Common (registered common land number CL228). It forms part of the common known as The Green, Hall Hill, Fort Road, Parsonage, Walton and Tilbury Fort Commons (ID 33611).

Thank you for your letter dated 10th August 2018 enclosing location drawings and scoping report showing details of the above proposal.

The application has been considered and I draw your attention to the following comments:

Access

Access for Fire Service purposes has been considered in accordance with the Essex Act 1987 - Section 13.

The arrangements should be in accordance with the details contained in the Approved Document to Building Regulation B5

More detailed observations on access and facilities for the Fire Service will be considered at Building Regulation consultation stage.

Building Regulations

It is the responsibility of anyone carrying out building work to comply with the relevant requirements of the Building Regulations. Applicants can decide whether to apply to the Local Authority for Building Control or to appoint an Approved Inspector.

Local Authority Building Control will consult with the Essex Police, Fire and Crime Commissioner Fire and Rescue Authority (hereafter called "the Authority") in accordance with "Building Regulations and Fire Safety - Procedural Guidance".

Approved Inspectors will consult with the Authority in accordance with Section 13 of the Building (Approved Inspectors etc.) Regulations 2010 (as amended).

Water Supplies

The architect or applicant is reminded that additional water supplies for fire-fighting may be necessary for this development. The architect or applicant is urged to contact the Water Technical Officer at Service Headquarters, telephone 01376-576344.

Sprinkler Systems

"There is clear evidence that the installation of Automatic Water Suppression Systems (AWSS) can be effective in the rapid suppression of fires. Essex County Fire & Rescue Service (ECFRS) therefore uses every occasion to urge building owners and developers to consider the installation of AWSS. ECFRS are ideally placed to promote a better understanding of how fire protection measures can reduce the risk to life, business continuity and limit the impact of fire on the environment and to the local economy.

Even where not required under Building Regulations guidance, ECFRS would strongly recommend a risk based approach to the inclusion of AWSS, which can substantially reduce the risk to life and of property loss. We also encourage developers to use them to allow design freedoms, where it can be demonstrated that there is an equivalent level of safety and that the functional requirements of the Regulations are met."

If you have any further queries, then please contact the above Officer quoting our reference number.

Yours faithfully



Ken Acton
Fire Safety Officer
South West Area Command

From: Meakins, Corinne [mailto:corinne.meakins@forestrycommission.gov.uk] **On Behalf Of** East and East Midlands Forest Area Enquiries
Sent: 13 August 2018 10:12
To: Thurrock FPG
Subject: Forestry Commission response EN010092-000018 Thurrock Flexible Generation Plant (the Proposed Development)

To Emma Cottam,

Thank you for consulting the Forestry Commission on this application , there doesn't appear to be any ancient woodland close to the site that would l be impacted by this application therefore we do not have any comment to make.

Yours sincerely

[redacted]

Corinne Meakins
Local Partnership Advisor
East and East Midlands
Forestry Commission England
Tel: 0300 067 4583
[redacted]
www.forestry.gov.uk

Gravesham Borough Council

Delegated Report

Application No:	20180853
Location:	Tilbury Power Station Fort Road Tilbury Essex
Description:	Consultation is in regard to a request made to the Secretary of State for a Scoping Opinion made under Regulations 10 and 11 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 in regard to a Scoping Report (RPS Reference: OXF10872/July2018/Revision 8) submitted by RPS Group in relation to a prospective NSIP made under the Planning Act 2008 (as amended) regarding a prospective Development Consent Order application for the construction and operation of: 1) Reciprocating gas engines with rated electrical output totalling 600 MW; 2) Batteries with rated electrical output of 150 MW and storage capacity of up to 600 MWh; 3) Gas, electricity and potential cooling water connections, private access road(s) and minor public highway widening for delivery of large loads; 4) Designation of replacement common land (exchange land) and possible creation of habitat for protected species translocation; and 5) Possible transfer of land to Thurrock Council
Applicant:	The Planning Inspectorate

Proposal

This is a request under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 for a scoping opinion in relation to a prospective NSIP made under the Planning Act 2008 (as amended) regarding a prospective Development Consent Order application for the construction and operation of:

1) Reciprocating gas engines with rated electrical output totalling 600 MW;

2) Batteries with rated electrical output of 150 MW and storage capacity of up to 600 MWh;

3) Gas, electricity and potential cooling water connections, private access road(s) and minor public highway widening for delivery of large loads;

4) Designation of replacement common land (exchange land) and possible creation of habitat for protected species translocation; and

5) Possible transfer of land to Thurrock Council

Relevant Planning History

This development site is located within an adjoining authority's jurisdiction and Gravesham Borough Council has no information, other than what is contained in the above mentioned scoping report as to the planning history of the site. Irrespective of this fact, the Council has been consulted on a number of applications within that adjoining authority's jurisdiction and those which are considered relevant are listed below:

20120446	Scoping Opinion under Regulation 13 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011, proposal to build and operate a two stage advanced recycling and electricity generation facility. Port of Tilbury, Thurrock Decision No Objections Decided 29/08/2012
20120666	Scoping Opinion under Regulation 13 of Town and Country Planning (Environmental Impact Assessment) Regulations 2011 for proposed Biomass Phase 2, proposed commercial greenhouse development. Tilbury Biomass Phase 2, Thurrock Decision No Objections Decided 29/08/2012
20120818	Consultation regarding outline application for works required on the Tilbury Power Station site (onshore application) to extend the lifetime by 12 - 15 years. Tilbury Power Station Site, Fort Road, Tilbury Decision No Objections Decided 16/08/2013
20120819	Consultation regarding outline application for works needed in or on the tidal Thames (offshore application) to extend Tilbury Power Station lifetime by 12 - 15 years. Tilbury Power Station Site, Fort Road, Tilbury Decision No Objections Decided 16/08/2013
	Request for an Environmental Impact Assessment (EIA) Scoping Opinion in respect of (a): proposed redevelopment of land for use as a port in association with

20160850	the existing Port of Tilbury, comprising a roll on/roll off (Ro-Ro) terminal, aggregates terminal including new and improved conveyors, external storage, improvements to existing land access, creation of hard surfaced pavements, erection of welfare buildings, improvements of an extensions to existing jetty including creation of new Ro-Ro berth and (b) construction of new and improved surface access to the land at the former Tilbury Power Station in association with the change of use and redevelopment of the land for port uses comprising new link road from Ferry Road (A1089) to Fort Road, (including associated changes to local highway and rights of way network) and formation of a rail spur and sidings. Tilbury 2 Power Station, Fort Road, Tilbury Decision - Observations Sent Date – 13.10.2016
20170320	Consultation on a scoping opinion and under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009-Regulation 9. Port of Tilbury London Ltd, Tilbury Freeport, Tilbury. Decision - Observations Sent Date – 24.04.2017
20170388	Continued re-profiling of the site 9 metres AOD using inert reclamation material imported by river, in place of Pulverised Fuel Ash from the adjacent now redundant Power Station. Land Adjacent Tilbury Power Station, Fort Road, Tilbury Decision - Observations Sent Date – 27.04.2017

Representations

The Planning Inspectorate, being the Appropriate Authority is responsible for undertaking consultation on this Scoping request and Gravesham Borough Council are only a consultee. Therefore, there is no requirement or obligation on the part of GBC to undertake any external consultation in regard to this submission. The Planning Inspectorate would have consulted directly with: The Environment Agency; Historic England; the Marine Maritime Organisation; Natural England; Port of London Authority; the Royal Society for the Protection of Birds (RSPB), Etc.

As this is an application for a scoping opinion, no neighbour consultations have been carried out.

Appraisal

Background

Due to the scale of the prospective development, the proposal would be deemed to be a Nationally Significant Infrastructure Project (NSIP), which would fall to be considered by The Planning Inspectorate (PINs), as it relates to the construction of a generating station in England with an energy generating capacity in excess of 50 megawatts. (Articles 14(1)(a) and 15(1) of the Planning Act 2008 (as amended).

Power Stations with an energy generating capacity in excess of 300 megawatts are considered to be Schedule 1 development as defined by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regs). The definition of an Environmental Impact Assessment (EIA) Development, as set out in Regulation 3(2) of the EIA Regs is development that falls within Schedule 1 of the EIA Regs. Therefore an EIA will be required.

Regulation 10 of the EIA Regs allows for the applicant to seek a scoping opinion from the Secretary of State as to the content of the EIA and that is the subject of this consultation form PINs.

Considerations

Regulation 5 of the EIA Regs details information for inclusion in an EIA. In addition to this, the internal responses from the Council's Environmental Protection Team and any other relevant representations need to be considered in terms of whether the EIA scope needs to be broadened.

The EIA scoping report is comprehensive, covering Air Quality; The Aquatic Environment; Ground Conditions and Hydrology; Flooding; Terrestrial Ecology; Landscape and Visual Effects; Noise and Vibration Traffic and Transport; Socio-Economic and Amenity; Cultural Heritage; Population and Human Health; Waste; and Cumulative and In-Combination Effects. In terms of these areas listed below the Council would defer to the expertise of the relevant expert/statutory bodies:

- The Aquatic Environment – The Environment Agency and Natural England;
- Ground Conditions and Hydrology – The Environment Agency;
- Flooding - The Environment Agency;
- Terrestrial Ecology - The Environment Agency and Natural England;
- Traffic and Transport – The Highways Agency, if relevant, and the relevant Local/County Planning Authority;
- Cultural Heritage; English Heritage; and Waste – The Environment Agency and the relevant Local/County Planning Authority

From a Gravesham perspective, the key issues that need to be covered by the Environmental Statement (both on a solus basis and in combination with other schemes) are:

- Noise

- Air Quality
- Landscape and visual resources
- Cultural heritage
- Terrestrial and marine ecology

In terms of cumulative impacts, the list of projects included in the Scoping Report includes:

- POTLL Tilbury 2
- Lower Thames Crossing
- Tilbury Green Power (within existing Tilbury Docks area – Tilbury 1)
- The continuing demolition of RWE Tilbury B power station
- RWE proposals for Tilbury Energy Centre
- London Distribution Park
- Goshens Farm land remediation

Cumulative impacts should be considered for both the construction and operational phases of the developments. In addition, consideration should be given as to the implications of some of the above not coming forward, given they do all have consent or there may be a failure to implement. For example, in the event of Tilbury 2 or the Tilbury Energy Centre not being granted consent or being taken forward, the proposed development subject of current scoping would be in a more exposed location relative to Gravesham given the absence of screening development. This may have implications in terms of visual impact and noise transmission.

It is also suggested that consideration be given as to whether the NSIP proposals for London Resort at Swanscombe Peninsula could result in cumulative impacts that need to be taken into consideration – particularly if water cooling is used or water transport used during the construction phase, given the proposed Marine Conservation Areas detailed in the Scoping Report.

The following comments are provided in relation to the identified key areas of concern from a Gravesham perspective:

- <u>Noise</u>

Noise has been a key issue in relation to the proposals for Tilbury 2 and there is potential for noise generated at both the RWE Tilbury Energy Centre and the Tilbury Flexible Energy Generation Plant to impact both individually and cumulatively on sensitive receptors to the south of the River Thames. The adopted Gravesham Local Plan Core Strategy (2014) identifies a key development site on the waterfront at Gravesend Canal Basin (under policy CS04) which will result in the introduction of further residential units in this area.

The Council would therefore seek to ensure that potential noise impacts on both existing and potential sensitive noise receptors on the south side of the River Thames are fully understood for both the construction and operational phases. To ensure consistency of approach with adjoining projects, the developer is directed to the papers available on the NSIP website in relation to Tilbury 2 at https://infrastructure.planninginspectorate.gov.uk/projects/south-east/tilbury2/

The developer is advised in the first instance to contact Allan Glasson in the Council's environmental health section to discuss any issues relating to noise – e-mail allan.glasson@gravesham.gov.uk or telephone: 01474 33 72 55.

- Air Quality

The project has the potential (individually but particularly in combination with the other schemes listed above) to impact on air quality locally. As identified within the Scoping Report, a number of air quality management areas have been declared in Gravesham where there are exceedances of air quality objectives.

One of these covers the Gravesend town centre one-way system, details of which are available on line at http://www.gravesham.gov.uk/home/environmental-health/air-quality/air-quality-management-areas. Monitoring data and other information is also available on the Kentair website at http://www.kentair.org.uk/

The Environmental Statement should provide sufficient information to determine any potential impacts on air quality within the Gravesham area, including the significant impact this development may have on the background levels of nitrogen dioxide.

The developer is advised in the first instance to contact Deborah Wilders in the Council's environmental health section to discuss any issues relating to air quality – e-mail deborah.wilders@gravesham.gov.uk or telephone: 01474 33 72 41.

- Landscape and visual resources

The proposal will extend the area of industrial development to the east of Tilbury Fort, with the potential up to 60 x 40m high exhaust stacks in particular being a prominent feature. Whilst Green Belt is not an environmental designation per se, the development is likely to impact on the perception of openness and rurality of the countryside to the east of Tilbury lying north of the existing developed riverside. Taken in combination with Tilbury 2, the RWE Tilbury Energy Centre, and Lower Thames Crossing this could significantly change the landscape character of this area when viewed from south across the River Thames. The need to have security lighting on-site means that this impact also needs to be assessed both during the daytime and during hours of darkness.

Whilst the Scoping Report includes visual receptors to the south of the River Thames in Gravesham, it is suggested that the same ones be used as for Tilbury 2 / Tilbury Energy Centre so that there is consistency of approach and comparisons can be drawn between assessments.

Footpath NG1 and NS138 are of particular importance as the main riverside footpath comprised in the Saxon Shore Way/Coastal Path east of Gravesend. An assessment of visual impact from the junction of PROWs NS138 and NS318 is therefore welcome given its location adjacent to Shornemead Fort, a currently undesignated heritage asset forming part of the historic Thames defences. This therefore will also be important in determining potential impact on the significance of these heritage assets through development within their setting. A viewpoint adjacent to Gravesend Town Pier and at Windmill Hill is also supported as key vantage points.

However, it is requested that the visual impact of the proposal also be assessed from the Gravesend Riverside Leisure Area/New Tavern Fort given the popularity of this area as one of the key open spaces within Gravesham and its historical importance relative to Tilbury Fort. This would be consistent with the approach taken in respect of Tilbury 2 and the RWE Tilbury Energy Centre.

- Cultural heritage

  Whilst the Scoping Report refers to heritage assets to the north of the River Thames at 2.24 and at 8.23, there is no mention of the numerous assets to the south in Gravesham. Given the inter-relationship of these assets (particularly those relating to defence heritage) there is potential for development to the north to affect how those to the south are appreciated and interpreted in context.

  Fortunately, the proposal does not appear to directly affect the inter-visibility of West Tilbury with Tilbury Fort, which is historically important given the former is the site of the camp that supported the latter and where Elizabeth 1 made her speech at the time of the Spanish Armada. The incremental development of the area to the east of Tilbury forming the context of the defence heritage assets could however impact upon their significance and require justification and mitigation.

  Because of this, it is considered that the impact of the development in terms of its wider context both north and south of the river should be properly assessed as per Tilbury 2 / Tilbury Energy Centre.

- Terrestrial and marine ecology

  The Council would defer to Natural England and other specialist agencies with the necessary expertise to assess the impact of the proposals subject of the Scoping Report. However, it is noted that Natural England raised concerns regarding Tilbury 2 based on potential impact on nearby SPA/Ramsar sites, noting that existing activities at Goshen Farm could already be impacting adversely on bird populations. As such, it was unable to agree at the close of the examination that there would be no adverse impact on the designated sites or that the proposed Environmental Mitigation and Compensation Plan was an adequate response.

  For information, Natural England's deadline 7 response submitted at the close of the examination is available on line at https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000989-Natural%20England%20%20Written%20Response.pdf.

Whilst the Scoping Report covers the potential need for Appropriate Assessment under the Habitats Regulation, there doesn't appear to be mention of potential impact on Functionally Linked Habitat that supports the designated sites.
It is noted that such impacts were an area of concern in relation to the examination of the Tilbury 2 application as can be seen in the ExA's Report on the Implications for European Sites (13 July 2018) available on line at
https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000920-TIL2%20-%20Report%20on%20the%20Implications%20for%20European%20Sites%20(RIES).pdf

On looking at the EIA Scoping Report for Lower Thames Crossing (Oct 2017), Fig 9.1 sheet 2 of 5 at page 382 shows the foreshore to the River Thames and large areas lying immediately east of the main development site (within the red line boundary) subject of the current Scoping Report as areas of potential Functionally Linked Habitat (see https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-000006-LTC%20EIA%20Scoping%20Report.pdf)

Given the facility may be water cooled and result in changes to water temperature in the River Thames and proximity to other areas that Highways England has identified as potential Functionally Linked Habitat, it is suggested that implications in terms of survey and analysis be discussed with Natural England.

Other Issues

It is noted that on alternatives to the proposed scheme, paragraph 5.22 onwards sets out the required locational criteria for such a development; alternative technologies considered; alternative means of cooling; and alternative designs. In particular, 5.24 states that a number of potential locations have been considered through a sequential site search exercise and that these will be detailed in the Environmental Statement. Paragraph 6.10 then goes on to say that a consideration of development location, scale and technology has not identified any reasonable alternatives, taking into account the need for a development of the nature proposed.

However, paragraph 5.22 also includes as a key driver to site selection not only the physical requirements of proximity to gas and grid connections (along with avoiding the need to construct new long distance grid connections and loss of electricity through transmission) but also land ownership on the basis that this can reduce the timescale, cost and uncertainty of delivery.

Whilst National Policy Statement EN1, the Overarching National Policy Statement for Energy (EN- 1, July 2011) sets out the Government's approach to the consideration of alternatives within section 4.4, paragraph 4.4.1 makes it quite clear that the existence or otherwise of alternatives as part of the decision making process is a matter of law even though guiding principles are provided in the subsequent paragraph 4.4.3.

In this context, it would be helpful if the Planning Inspectorate could provide guidance within its Scoping Opinion as to whether ownership is in itself sufficient to constrain a consideration of reasonable alternative in this case. One reason for asking this is that,

aside from voluntary acquisition, the 2008 Act process provides for CPO whereby an absence of ownership or control would not in theory necessarily prevent delivery.

There is also a need to avoid a situation whereby the EIA process is effectively circumvented simply on the basis of ownership considerations – i.e. the development has to be here because that's where the developer wants it and therefore there is by definition no reasonable alternative.

The Council is also mindful that the proposal is being brought forward in the context of a market for electricity supply whereby there may be environmentally preferable alternatives that could be delivered either by this developer or by others. This may have implications if Appropriate Assessment under the Habitats Regulations is required and a case needs to be made in terms of Imperative Reasons of Overriding Public Interest (IROPI).

Whilst not an EIA consideration, the Council notes that the application site lies within the Green Belt where specific policy considerations apply. Section 5.10 of EN-1 makes clear that national Green Belt policy applies in relation to energy projects and that 'inappropriate development' should not be permitted unless 'very special circumstances' that clearly outweigh definitional, actual and any other harm are demonstrated. In determining applications significant weight is to be accorded the protection of the Green Belt.

Taken as a whole, the proposed development would appear to fall outside the exceptions to Green Belt policy now listed in the revised National Planning Policy Statement (NPPF, 2018) and it would be the responsibility of the applicant to demonstrate that the above policy hurdle is passed. This in itself would require the applicant to demonstrate that reasonable alternatives have been properly considered or that the demand for electricity would not otherwise be met.

It may therefore be prudent for the developer to consider the implications of this in conjunction with the EIA workstream, as the need to properly consider reasonable alternatives may run in parallel.

Local Finance Considerations

No local finance considerations are relevant.

Conclusions and Reasons for Decision

It is recommended that subject to the scoping opinion adequately covering the above issues, including:

- The importance of the possible impact on ecological receptors in the locality being quantified and suitable mitigation being proposed and implemented in the future to ensure that any impact is minimal and acceptable to all parties;

- The air quality modelling proposed would not provide the real picture of possible impact on all receptors. Modelling which uses only the annual average wind direction (i.e. south westerly), does not provide the real picture of possible impact on those receptors south of the river therefore modelling needs to take into account the fact that, at certain times of the year, north easterly and east north easterly winds are equal to, if not

greater than, the prevalence of south westerlies thus directing any emissions towards receptors south of the river.

- The importance of the Cumulative effects, as details at Section 6 – EIA Processes (Page 58), and the 'In-Combination Effects' are thoroughly assessed. The Council considered that this element is the most important part of the Environmental Impact Assessment process, due to the significant number of Nationally Strategic Infrastructure Projects and other large planning proposals currently being promoted, considered or determined in the vicinity of the proposed development site. The Council stresses that the in-combination effects in regard to air quality, noise and vibration, landscape and visual effects, socio-economic and cultural heritage are the areas where it considered special attention needs to be undertaken in regard to this development.

Subject to the above matters being adequately address, Gravesham Borough Council would not raise concern in regard to the Scoping Report being adopted pursuant to Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

See draft Decision

Case Officer: Chris Butler	**Team Leader:** Wendy Lane
Signed: 	**Signed:** Wendy Lane
Dated: 7th September 2018	**Dated:** 7th September 2018

Recommendation for 20180853 DCREC

Officer	Mr Christopher Butler
Proposal	Consultation is in regard to a request made to the Secretary of State for a Scoping Opinion made under Regulations 10 and 11 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 in regard to a Scoping Report (RPS Reference: OXF10872/July2018/Revision 8) submitted by RPS Group in relation to a prospective NSIP made under the Planning Act 2008 (as amended) regarding a prospective Development Consent Order application for: Construction and operation of: 1) Reciprocating gas engines with rated electrical output totalling 600 MW; 2) Batteries with rated electrical output of 150 MW and storage capacity of up to 600 MWh; 3) Gas, electricity and potential cooling water connections, private access road(s) and minor public highway widening for delivery of large loads; 4) Designation of replacement common land (exchange land) and possible creation of habitat for protected species translocation; and 5) Possible transfer of land to Thurrock Council
Address	Tilbury Power Station Fort Road Tilbury Essex
Valid	10th August 2018.
Target	7th September 2018

Keep File	**~~Y/~~N (delete as appropriate)**
Reason	**~~Enforcement/Complex/Major/Appeal~~**

Works of Construction Informative **~~Y/~~N (delete as appropriate)**

Recommendation – Observations Sent – as set out below:

From a Gravesham perspective, the key issues that need to be covered by the Environmental Statement (both on a solus basis and in combination with other schemes) are:

- Noise
- Air Quality
- Landscape and visual resources
- Cultural heritage
- Terrestrial and marine ecology

In terms of cumulative impacts, the list of projects included in the Scoping Report includes:

- POTLL Tilbury 2
- Lower Thames Crossing
- Tilbury Green Power (within existing Tilbury Docks area - Tilbury 1)
- The continuing demolition of RWE Tilbury B power station
- RWE proposals for Tilbury Energy Centre
- London Distribution Park
- Goshens Farm land remediation

Cumulative impacts should be considered for both the construction and operational phases of the developments. In addition, consideration should be given as to the implications of some of the above not coming forward, given they do all have consent or there may be a failure to implement. For example, in the event of Tilbury 2 or the Tilbury Energy Centre not being granted consent or being taken forward, the proposed development subject of current scoping would be in a more exposed location relative to Gravesham given the absence of screening development. This may have implications in terms of visual impact and noise transmission.

It is also suggested that consideration be given as to whether the NSIP proposals for London Resort at Swanscombe Peninsula could result in cumulative impacts that need to be taken into consideration - particularly if water cooling is used or water transport used during the construction phase, given the proposed Marine Conservation Areas detailed in the Scoping Report.

The following comments are provided in relation to the identified key areas of concern from a Gravesham perspective:

- Noise

Noise has been a key issue in relation to the proposals for Tilbury 2 and there is potential for noise generated at both the RWE Tilbury Energy Centre and the Tilbury Flexible Energy Generation Plant to impact both individually and cumulatively on sensitive receptors to the south of the River Thames. The adopted Gravesham Local Plan Core Strategy (2014) identifies a key development site on the waterfront at Gravesend Canal Basin (under policy CS04) which will result in the introduction of further residential units in this area.

The Council would therefore seek to ensure that potential noise impacts on both existing and potential sensitive noise receptors on the south side of the River Thames are fully understood for both the construction and operational phases. To ensure consistency of approach with adjoining projects, the developer is directed to the papers available on the NSIP website in relation to Tilbury 2 at https://infrastructure.planninginspectorate.gov.uk/projects/south-east/tilbury2/

The developer is advised in the first instance to contact Allan Glasson in the Council's environmental health section to discuss any issues relating to noise - e-mail allan.glasson@gravesham.gov.uk or telephone: 01474 33 72 55.

- Air Quality

The project has the potential (individually but particularly in combination with the other schemes listed above) to impact on air quality locally. As identified within the Scoping Report, a number of air quality management areas have been declared in Gravesham where there are exceedances of air quality objectives.

One of these covers the Gravesend town centre one-way system, details of which are available on line at http://www.gravesham.gov.uk/home/environmental-health/air-quality/air-quality-management-areas. Monitoring data and other information is also available on the Kentair website at http://www.kentair.org.uk/

The Environmental Statement should provide sufficient information to determine any potential impacts on air quality within the Gravesham area, including the significant impact this development may have on the background levels of nitrogen dioxide.

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The proposal will extend the area of industrial development to the east of Tilbury Fort, with the potential up to 60 x 40m high exhaust stacks in particular being a prominent feature. Whilst Green

Belt is not an environmental designation per se, the development is likely to impact on the perception of openness and rurality of the countryside to the east of Tilbury lying north of the existing developed riverside. Taken in combination with Tilbury 2, the RWE Tilbury Energy Centre, and Lower Thames Crossing this could significantly change the landscape character of this area when viewed from south across the River Thames. The need to have security lighting on-site means that this impact also needs to be assessed both during the daytime and during hours of darkness.

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Because of this, it is considered that the impact of the development in terms of its wider context both north and south of the river should be properly assessed as per Tilbury 2 / Tilbury Energy Centre.

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Imperative Reasons of Overriding Public Interest (IROPI).

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Taken as a whole, the proposed development would appear to fall outside the exceptions to Green Belt policy now listed in the revised National Planning Policy Statement (NPPF, 2018) and it would be the responsibility of the applicant to demonstrate that the above policy hurdle is passed. This in itself would require the applicant to demonstrate that reasonable alternatives have been properly considered or that the demand for electricity would not otherwise be met.

It may therefore be prudent for the developer to consider the implications of this in conjunction with the EIA workstream, as the need to properly consider reasonable alternatives may run in parallel.

Conclusions

Subject to the above and below matters being adequately address, Gravesham Borough Council would not raise concern in regard to the Scoping Report being adopted pursuant to Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

- The importance of the possible impact on ecological receptors in the locality being quantified and suitable mitigation being proposed and implemented in the future to ensure that any impact is minimal and acceptable to all parties;

- The air quality modelling proposed would not provide the real picture of possible impact on all receptors. Modelling which uses only the annual average wind direction (i.e. south westerly), does not provide the real picture of possible impact on those receptors south of the river therefore modelling needs to take into account the fact that, at certain times of the year, north easterly and east north easterly winds are equal to, if not greater than, the prevalence of south westerlies thus directing any emissions towards receptors south of the river.

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Case Officer: Mr Christopher Butler

Signed:



Dated: 7th September 2018

Team Leader: Wendy Lane

Signed: Wendy Lane

Dated: 7 September 2018

HSE

Health and Safety Executive

HID Policy - Land Use Planning
NSIP Consultations
Building 2.2, Redgrave Court
Merton Road, Bootle
Merseyside, L20 7HS

Your ref: EN010092
Our ref: 4.2.1.6479

HSE email: NSIP.applications@hse.gov.uk

FAO Emma Cottam
The Planning Inspectorate
Temple Quay House
Temple Quay,
Bristol
BS1 6PN

Dear Ms. Cottam

7th September 2018

PROPOSED Thurrock Flexible Generation Plant (the project)
PROPOSAL BY Thurrock Power Ltd (the applicant)
INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2009 (as amended) – Regulations 8 and 9

Thank you for your letter of 10 August 2018 regarding the information to be provided in an environmental statement relating to the above project.

HSE does not comment on EIA Scoping Reports but the following information is likely to be useful to the applicant.

HSE's land use planning advice

Will the proposed development fall within any of HSE's consultation distances?

According to HSE's records there is one major accident hazard site and two major accident hazard pipelines within the proposed development boundary of the Thurrock Flexible Generation Plant for this nationally significant infrastructure project:

Major accident hazard sites:

1) HSE ref H1277; operated by British Bata Shoe Company

Major accident hazard pipelines:

1) HSE ref 8189, operated by National Grid PLC; 5 feeder Hordon / Tilbury Thomas North
2) HSE ref 8191; operated by National Grid PLC; 18 feeder Stapleford / Tilbury Thomas North

HSE's Land Use Planning advice would be dependent on the location of areas where public may be present and so it is possible that HSE may advise against this proposal. When we are consulted further by the Applicant with further information, under Section 42 of the Planning Act 2008, we can update our advice.

Hazardous Substance Consent

The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) will probably require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others for which HSC is required, and the associated Controlled Quantities, are set out in The Planning (Hazardous Substances) Regulations 2015 as amended.

Hazardous Substances Consent would be required to store or use any of the Named Hazardous Substances or Categories of Substances at or above the controlled quantities set out in schedule 1 of these Regulations.

Further information on HSC should be sought from the relevant Hazardous Substances Authority.

Consideration of risk assessments

Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the assessment of significant effects to include, where relevant, the expected significant effects arising from the proposed development's vulnerability to major accidents. HSE's role on NSIPs is summarised in the following Advice Note 11 an annex on the Planning Inspectorate's website - Annex G – The Health and Safety Executive . This document includes consideration of risk assessments on page 3.

Explosives sites

HSE has no comment to make as there are no licensed explosive sites in the vicinity.

Please send any further electronic communication on this project directly to the HSE's designated e-mail account for NSIP applications. Alternatively, any hard copy correspondence should be sent to:

Mr Dave Adams (MHPD)
NSIP Consultations
2.2 Redgrave Court
Merton Road
Bootle, Merseyside
L20 7HS

Yours sincerely,

[redacted]

PP
Dave Adams
CEMHD4 Policy

From: Gonet, Teresa [mailto:Teresa.Gonet2@highwaysengland.co.uk]
Sent: 31 August 2018 13:52
To: Thurrock FPG
Cc: Planning SE; transportplanning@dft.gsi.gov.uk; growthandplanning
Subject: FAO: Case Officer Emma Cottam, Highways England response re EIA Scoping Requestfor Sub Station Power Station, Fort Road, West Tilbury, RM18 8UL

For the attention of: Case Officer Emma Cottam

Site: Sub Station Power Station, Fort Road, West Tilbury, RM18 8UL

Development: EIA Scoping Request

Highways England's Ref No: #5706

Dear Emma,

Thank you for your consultation letter dated 10th August 2018 on the above EIA scoping request for the proposed Sub Station Power Station, West Tilbury. Highways England has been appointed by the Secretary of State for Transport as strategic highway company under the provisions of the Infrastructure Act 2015 and is the highway authority, traffic authority and street authority for the strategic road network (SRN). The SRN is a critical national asset and as such Highways England works to ensure that it operates and is managed in the public interest, both in respect of current activities and needs as well as in providing effective stewardship of its long-term operation and integrity.

Highways England have no comment on whether an EIA is required; but if it is (or is produced voluntarily), it should be compatible and consistent with the Transport Assessment that should also be submitted as part of this application and should contain information on all transport related effects including noise, vibration and air quality.

The proposed method of assessment for the EIA should be in line with Highways England's recommended method of drawing upon the information presented in the Transport Assessment. Any assessment should be undertaken in accordance with the DfT Circular 02/2013 "The Strategic Road Network and the Delivery of Sustainable Development" outlining how Highways England will engage with developers including assessment requirements to deliver growth and safeguard the operation of the SRN. This includes a robust assessment of the vehicular impacts "with" and "without" development for the horizon year (full occupation) and the end of the Local Plan period to examine the net impact of non-consented development. Any modelling will also need to accurately reflect the Local Plans of neighbouring authorities.

In the case of this proposed development, Highways England is interested in the potential impact that the development might have upon the M25, in particular Junction 30, the A13 and A1089. We are interested as to whether there would be any adverse safety implications or material increase in queues and delays on the SRN as a result of development or construction phase where it may be for a prolonged period of time with excessive HGV and large plant trips. The project of

this magnitude has the potential to generate a significant number of heavy goods vehicle (HGV) trips, a large proportion of which are likely use the SRN. In order to minimise potential impacts to the SRN we would look to site operators to identify opportunities to reduce trips during peak periods, this might be through construction and operational management plans to support individual sites within an identified corridor.

It should be noted that Highways England's Lower Thames Crossing team has also reviewed this consultation and there are numerous areas where the two proposed schemes overlay, creating potential conflicts. It should be noted that engagement between Highways England and the Developer has already begun and we look forward to continuing that engagement as the proposals develop. Should the scheme proposals, as submitted to PINS change significantly at any point, we should be consulted and given the opportunity to comment further on revised proposals.

I trust you find these comments useful. Please do not hesitate to contact me if you require further information through our team mailbox planningse@highwaysengland.co.uk

Thank you,

Sent on behalf of Janice Burgess, Spatial Planning Manager at Highways England

Teresa Gonet,
OD SE Spatial Planning Team
Highways England | Bridge House | 1 Walnut Tree Close | Guildford | GU1 4LZ
Tel: +44 (0) 300 470 1165

Web: www.highways.gov.uk, www.highwaysengland.co.uk

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Highways England Company Limited | General enquiries: 0300 123 5000 |National Traffic Operations Centre, 3 Ridgeway, Quinton Business Park,

Birmingham B32 1AF | *https://www.gov.uk/government/organisations/highways-england* **|** *info@highwaysengland.co.uk*

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Historic England

EAST OF ENGLAND OFFICE

Ms Emma Cottam
The Planning Inspectorate
Temple Quay House
2 The Square
Bristol
BS1 6PN

Direct Dial: 01223 582720

Our ref: PL00472630

6 September 2018

Dear Ms Cottam

Planning Act 2008 (as amended) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) - Regulations 10 and 11

Application by Thurrock Power (the applicant) for an Order granting Development Control Consent for the Thurrock Flexible Generation Plant (the Proposed Development) PINS REF: EN10092-000018

Thank you for your letter of 10 August with a formal request for a scoping opinion in relation to the above application. Historic England, as the government's lead advisor on the historic environment, would like to offer comments on this proposal, taking into consideration the information provided by the applicant: This is the EIA Scoping Report - Thurrock Flexible Generation Plant Land adjacent to National Grid Sub Station, Tilbury By RPS on behalf of Thurrock Power Ltd.

Historic England Advice

1. The proposed development (Thurrock Flexible Generation Plant) would comprise reciprocating gas engines, batteries and associated electrical and control equipment, a new permanent access road and potential temporary construction access roads, a gas pipeline connection to the gas national transmission system and potentially a cooling water pipeline to the River Thames. The electric export connection will be via underground cables to the adjacent National Grid Tilbury substation.

2. The historic environment is a finite and non-renewable environmental resource which includes designated and non-designated heritage assets, historic landscapes and sites of historic and evidential interest. It is a rich and diverse part of England's cultural heritage and makes a valuable contribution to our cultural, social and economic life. This development would be within a wider historic landscape that contains a number of designated and non-designated heritage assets. For clarity, we have set out our comments on the historic environment under the following headings: built historic environment, buried archaeological remains/geoarchaeology and marine

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archaeological remains.

3.0 Built Historic Environment.

3.1 There are no designated heritage assets which would be directly affected by the proposed development. The principal designated heritage assets which may be impacted indirectly by the proposed development are: the scheduled monuments at Tilbury Fort, Earthworks near West Tilbury Church, WWII anti-aircraft battery at Bowaters Farm, East Tilbury Battery and Coalhouse Fort. Separately listed buildings at Grade I include St Katharine's Church and those at Grade II* include the riverside station at Tilbury Cruise Terminal and the Church of St James. Seven grade II listed buildings also fall within the study area.

3.2 We advise that the impact of the proposed development on the setting and significance of designated and non-designated heritage assets to be fully assessed in accordance with legislation, policy and guidance. In particular, we recommend the analysis follows the staged approach to assessment set out the Good Practice Advice in Planning 3: The Setting of Heritage Assets. The ES document would need to provide sufficient visual information to illustrate how the proposed infrastructure would be seen in views from key designated heritage assets and would be pleased to provide more detailed advice on proposed viewpoints for photomontages once an initial list has been drawn up.

3.3 We would recommend a single Historic Environment chapter for the ES. However, the historic environment sections would also need to integrated, and cross referenced to other relevant chapters. This is most relevant to the Landscape and Visual Assessment where we consider that it would be important to use historic environment receptors in to the assessment process. We consider that photomontages and/or wirescape images from heritage specific viewpoints would be essential particularly from key designated heritage assets. Wider landscape views are also needed, including any images that would seek to illustrate cumulative impacts in view of the quantum of development proposals in the vicinity. The assessment of 'setting' likewise should not be solely be restricted to visual impact, and would need to consider the impact from other environmental factors such as noise, traffic and lighting.

3.4 Historic England has in the past raised concerns about the use of matrices and table to determine significance, magnitude of impacts and receptor sensitivity. This is in reference to the Design Manual for Roads and Bridges (DMRB) which is commonly used for the Environmental Impact Assessment (EIA) process for infrastructure projects. Whilst the standardised EIA matrices are a useful tool, the analysis of impact, harm, significance and setting is a matter of qualitative and expert judgment which cannot be achieved solely by the use of systematic matrices and the use of tables should be seen primarily as supporting material. We recommend that the applicant seek to deliver a clearly expressed, iterative and non-technical narrative for

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significance and harm, which is tailored to this specific environment.

4.0 Archaeology/Geoarchaeology

4.1 There is geophysical data which suggests potential for undesignated buried archaeological remains within the development area. If the water cooling option were to be adopted there would be potential impacts on marine archaeological remains. It is thus likley that there will be direct and indirect impacts on the terrestrial and marine historic environments that will need to be taken into account.

A geophysical survey (magnetometery) has been carried out across the development area (Wessex 2017), which has identified some anomalies, but it is important to note that this approach will not identify some remains of archaeological interest. This includes organic remains, such as wooden structures or boats, or deposits such as peat that may be of archaeological and palaeoenvironmental interest. A number of studies carried out in and around Tilbury Fort have identified important Holocene period alluvial and peat sequences indicative of periods of marine and regression and transgression. It is noted in Section 8.164 that the geological maps and BGS borehole records indicate that the main development site is underlain by Alluvium, suggesting that similar sequences Holocene sequences may be preserved here as well. The previous studies have demonstrated that the accumulation of peat was diachronous, highlighting the potential of the different sequences sampled to provide information about site specific landscape evolution over time and the mosaic of environments that existed on the floodplain in the past. Further work will therefore need to be carried out to determine the potential of the alluvial deposits identified at the site and the potential that these deposits to address archaeological questions.

We would recommend in the first instance that the existing sequences/deposit models produced for nearby sites are investigated as part of the desk-based assessment phase of works. This may provide useful information about the proposed development area as well as highlight gaps in the understanding that could be targeted for further study. We would also recommend a joined-up approach is used when investigations are considered for the development area, whether this is to address engineering questions, the presence of contamination or for archaeological purposes. Communication and collaboration between the various specialists could reduce the duplication of effort and maximise the potential of each sample to address the questions that need to be investigated as part of the application process.

Yours sincerely,

Deborah Priddy

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Historic England

EAST OF ENGLAND OFFICE

Inspector of Ancient Monuments
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Yours sincerely,

Deborah Priddy
Inspector of Ancient Monuments
[redacted]

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Marine Management Organisation

Comments on Environmental Impact Assessment Scoping Report

Title: Thurrock Flexible Generation Plant

Applicant: Thurrock Power Ltd

MMO Reference: DCO/2018/00015

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ENVIRONMENT ISO 14001 CERTIFIED
QUALITY ISO 9001 CERTIFIED

1 Proposal

1.1 Thurrock Power Ltd proposes to develop a flexible generation plant on land north of Tilbury Substation in Thurrock. The flexible generation plant will provide up to 600 megawatts (MW) of electrical generation capacity and up to 150 MW of battery storage capacity on a fast response basis when called by the National Grid. If consented, it will provide resilience to the electricity grid when this is needed due to intermittent generation from other sources (such as wind power) or short term demand from consumers.

1.2 If consented, the flexible generation plant itself will comprise reciprocating gas engines, batteries and associated electrical and control equipment. A new permanent access road and potential temporary construction access roads, a gas pipeline connection to the gas national transmission system and potentially a cooling water pipeline to the River Thames are proposed for development. The electrical export connection will be via underground cables to the immediately adjacent National Grid Tilbury Substation.

2 Project Background

2.1 Alternative sites and technologies for the proposed development have been considered by Thurrock Power. The proposed development site offers a suitable connection to the London 275 kilovolt (kV) transmission network at Tilbury Substation. The guidance of national policy, consultation with National Grid and a detailed assessment of ‘Best Available Technology’ have together led the applicant to conclude that there is a need for a flexible generation plant using the technology proposed.

3 Location

3.1 The proposed main development site is located on land south west of Station Road near Tilbury, Essex, and comprises undeveloped land with no current buildings. The main development site is around 18 hectares (ha) in size and the entire area within the draft application boundary is around 182 ha. The main development site is approximately 800m east of Tilbury, with its immediate surroundings being agricultural land, other than the National Grid 275 kV Tilbury Substation immediately to the south, and the railway line passing through the application site boundary to the north of the main development site.

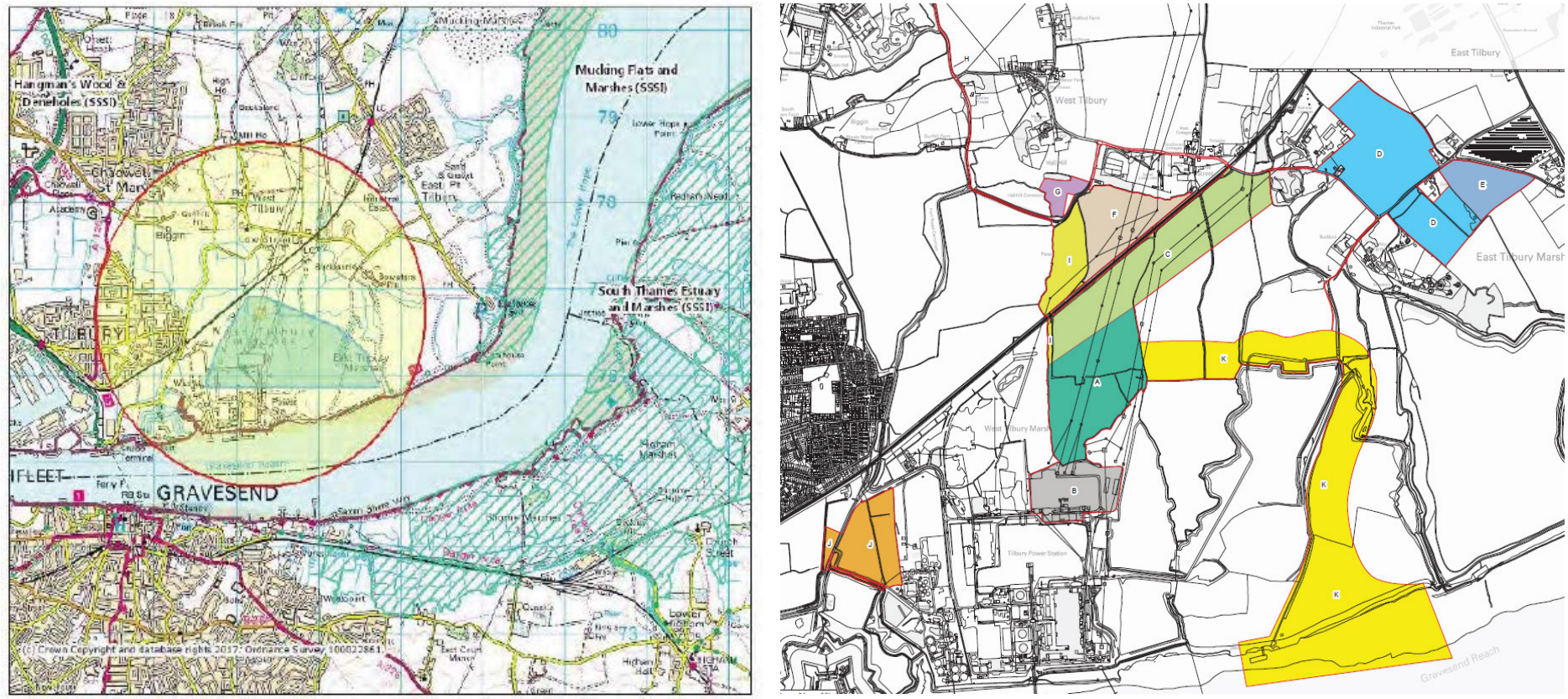


Figure 1: Location of proposed works for Thurrock Flexible Generation Plant (See EIA Scoping Report Figures for further details)

4 The Marine Management Organisation's role in Nationally Significant Infrastructure Projects

4.1 The Marine Management Organisation (MMO) was established by the Marine and Coastal Access Act 2009 (the "2009 Act") to make a contribution to sustainable development in the marine area and to promote clean, healthy, safe, productive and biologically diverse oceans and seas. The responsibilities of the MMO include the licensing of construction works, deposits and removals in the marine area by way of a marine licence[1] . Marine licences are required for deposits or removals of articles or substances below the level of Mean High Water Springs (MHWS), unless a relevant exemption applies under the Marine Licensing (Exempted Activities) (Amendment) Order 2013 (the "2013 Order").

4.2 In the case of Nationally Significant Infrastructure Projects ("NSIPs"), the Planning Act 2008 (the "2008 Act") enables Development Consent Order's ("DCO") for projects which affect the marine environment to include provisions which deem marine licences[2]. Alternatively, applicants may wish to separately seek consent for a marine licence directly from the MMO rather than having it deemed by a DCO.

4.3 For NSIPs where applicants choose to have a marine licence deemed by a DCO, during pre-application the MMO will advise developers on the aspects of a project that may have an impact on the marine area or those who use it. In addition to considering the impacts of any construction within the marine area, this would also include assessing any risks to human health, other legitimate uses of the sea and any potential impacts on the marine environment from terrestrial works.

4.4 Whether a marine licence is deemed within a DCO or consented independently by the MMO, the MMO is the delivery body responsible for post-consent monitoring, variation, enforcement and revocation of provisions relating to the marine environment. As such, the MMO has a keen interest in ensuring that provisions drafted in a deemed marine licence enable the MMO to fulfil these obligations. This includes ensuring that there has been a thorough assessment of the impact of the works on the marine environment (both direct and indirect), that it is clear within the DCO which works are consented within the deemed marine licence, that conditions or provisions imposed are proportionate, robust and enforceable and that there is clear and sufficient detail to allow for monitoring and enforcement. To achieve this, the MMO would seek to agree the deemed marine licence with the developer for inclusion with their application to the Planning Inspectorate ("PINS").

4.5 Further information on licensable activities can be found on the MMO website[3]. Further information on the interaction between PINS and the MMO can be found in our joint advice note[4].

4.6 The MMO recognises there is some overlap between the geographical jurisdiction of the MMO and the local planning authorities (i.e. between MHWS and mean low water springs).

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[1] Under Part 4 of the 2009 Act
[2] Section 149A of the 2008 Act
[3] https://www.gov.uk/guidance/do-i-need-a-marine-licence
[4] https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2012/04/Advice-note-11-Annex-B-MMO.pdf

4.7 The MMO has considered this and is of the view that matters which fall within the scope of the marine licensing provisions of the 2009 Act (i.e. anything below MHWS) are generally best regulated by conditions on marine licences. This should minimise the risk of inconsistency between different schemes of regulation, or of a duplication of controls.

4.8 In considering applications for marine licences to be consented independently by the MMO, the MMO regularly consults with bodies including, but not limited, to:

- The Environment Agency
- Natural England
- Natural Resources Wales (for works in or affecting Wales)
- the Maritime and Coastguard Agency
- Historic England
- local planning authorities
- local harbour authorities
- local inshore fisheries and conservation authorities
- the Royal Yachting Association (RYA)
- the Royal Society for the Protection of Birds
- the corporation of the Trinity House of Deptford Strond.

4.9 Where a marine licence is to be deemed within a DCO, the MMO would expect that comments provided by the above list of bodies and any other relevant bodies are taken into consideration.

5 Activities for this project that would be licensable under the 2009 Act

5.1 The report includes very limited detail regarding construction activities and their associated methodologies. Whilst this is the case, based on the information supplied, it would appear that construction of the intake and outfall structures and all associated works below MHWS associated with the proposed cooling water system would be licensable under the 2009 Act.

5.2 In addition to this, it would appear that from the scoping report (Section 3.35) the applicant proposes to utilise a jetty to the South East of the land package to facilitate access via barge (Item K, Figure 2, Sheet 1). Works to facilitate the use of the jetty as an access asset are also likely to be licensable under the 2009 Act.

5.3 Any additional works or activities taking place within the UK Marine Area (Section 42 of the 2009 Act) which may require a marine licence under the 2009 Act should be notified to the MMO at the earliest opportunity, and the impacts of such works considered in the Environmental Impact Assessment (EIA) process.

6 Scoping Opinion

6.1 On 10th August 2018, the Planning Inspectorate requested a Scoping Opinion from the MMO. In so doing, a Scoping Report entitled “EIA Scoping Report – Thurrock Flexible Generation Plant” has been submitted to the MMO for review.

6.2 We have significant concerns surrounding some of the screening & scoping decisions to-date particularly with respect to environmental impacts in the Marine Environment (such as fisheries). Beyond this matter which is clarified below, the MMO is broadly in agreement with the topics outlined in the Scoping Report and in addition, we outline that the following aspects be considered further during the EIA and must be included in any resulting Environmental Statement.

7 Cultural Heritage

7.1 The MMO welcomes the methodology for informing the Cultural Heritage Assessment which can be found in section 8.27 of the scoping report, but would defer to Historic England and their formal response to the PINS on this matter.

7.2 The MMO note that there are a number of heritage features within the vicinity of the proposed project area. The MMO is content that these have been considered in section 8.23 of the scoping report, and as per section 7.2 of this report, welcome the methodology for assessing potential impacts.

8 Landscape and Visual Impact

8.1 The MMO welcomes the methodology for informing the potential landscape and visual impacts which can be found in section 8.10 of the scoping report, including considering mitigation measures as part of the iterative design process.

8.2 Visual disturbance to local ornithological features should be considered in any final ensuing ES. The MMO draw your attention to the local Royal Society for the Protection of Birds (RSPB) Thames Estuary and Marshes Important Bird Area (IBA) which is within the direct vicinity of the proposed outfall, intake and jetty work area.

8.3 Visual disturbance to the species within the vicinity of works should be considered in any final ensuing ES. Whilst Natural England are most well-placed to advise on this matter, the MMO draw your attention to the following local designated sites: Mucking Flats and Marshes Site of Special Scientific Interest (SSSI); South Thames Estuary and Marshes SSSI; Thames Estuary and Marshes Special Protected Area and; Thames Estuary and Marshes Ramsar.

9 Noise and Vibration

9.1 The ES should include an assessment of the potential risk of impact of underwater noise on sensitive receptors. This should be supported by relevant and recent scientific literature, for example, Popper et al (2014) for fish and National Marine Fisheries Service (NMFS) (NOAA) (2016) for marine mammals.

9.2 The MMO agrees with the scoping in of 'aquatic environment' for further assessment. Section 8.110 of the report identifies that 'there may be disturbance of aquatic ecological receptors in the vicinity of the development during construction, including direct effects such as underwater noise on fish and aquatic mammal species'. However, detailed information on the construction works is limited at this stage. The MMO expect this to be expanded on as part of the ES.

9.3 Although not explicitly clear in the report, the MMO requests that the potential impacts of underwater noise on marine receptors to be considered in the

Environmental Statement (ES). Underwater noise (e.g. increased background noise and specific sound sources) may impact marine receptors in the following various ways:

- Masking – noise can interfere with an animal's ability to detect biologically important sounds
- Behavioural changes – noise can cause animals to alter their behaviour
- Physiological stress
- Auditory injury (hearing loss) – temporary or permanent
- Non- auditory injury / tissue damage
- Direct or indirect mortality

9.4 The MMO note that at this stage, no specific mitigation measures in relation to underwater noise have been proposed. This must be considered in the ES.

9.5 The MMO supports the scoping-in of the aquatic environment for further assessment. Specific marine receptors (to be scoped in) have not been identified as such, although information on the baseline conditions is provided in the report.

9.6 Detailed information of the proposed construction works is also limited, however, underwater noise has been identified as having the potential to directly affect fish and marine mammals. As above, the MMO expects that the potential impacts of underwater noise on marine receptors will be considered in the ES and this should be substantiated with detailed species-specific assessments.

9.7 Noise disturbance to local ornithological features should be considered in any final ensuing ES. The MMO draw your attention to the local RSPB Thames Estuary and Marshes IBA which is within the direct vicinity of proposed outfall, intake and jetty work area.

9.8 Noise disturbance to the species within the vicinity of works should be considered in any final ensuing ES. Whilst Natural England are most well-placed to advise on this matter, the MMO draw your attention to the following local designated sites: Mucking Flats and Marshes Site of Special Scientific Interest (SSSI); South Thames Estuary and Marshes SSSI; Thames Estuary and Marshes Special Protected Area and; Thames Estuary and Marshes Ramsar.

10 Contaminated Land, Land Use and Hydrogeology

10.1 The MMO welcomes the intention to assess the potential for contamination, particular consideration should be given to disturbance of the river bed sediment (both during construction and operation) within section 8.101 of the ES.

11 Marine Ecology and Fisheries

11.1 The scoping report discusses the likely requirement for thermal plume modelling to fully assess the potential impacts from the cooling water intake. The MMO request clarification that this includes the potential impact to benthos near the outfall pipe should be sought for the ES.

11.2 At present, the scoping report (section 8.112) only cites RWE Tilbury with regards to in-combination impacts concerning thermal plume. MMO require this to be

expanded on, taking into account any other facilities within an agreed study area which may lead to a temperature uplift on the Thames Water Body.

11.3 To date, the MMO has not been approached to inform the scope of thermal and/or chemical modelling for the cooling water system. MMO would expect these discussions to take place as a critical requirement at this stage of the project.

11.4 All other benthic aspects relevant to the construction and operation of the development have been scoped in. However, the intertidal and subtidal surveys are stated to commence in August 2018. Details of sampling design have not been clarified. Details on sampling equipment, methodology, sample location and level of sample replication should be provided in the ES and be sufficient for addressing the underlying reasons for the survey requirement i.e. biota, particle size distribution and contaminants.

11.5 Relevant datasets from the aquatic ecology surveys undertaken for the RWE Tilbury Energy Centre (TEC) development may become available and provide suitable information for the proposed development. This information should be provided in the ES.

11.6 In addition, an assessment of the cumulative impacts of the RWE TEC development's water-cooling proposal will be carried out. This information should be provided in the ES.

11.7 The MMO considers the data gathering and consideration of likely effects on benthos are appropriate.

11.8 Chemical treatment of biofouling within the once through water cooling system is not thought to be necessary due to knowledge of the nearby Tilbury Power Station's similar system; thus, avoiding the impact of chemical emissions on the benthos. If the use of chemical treatment is necessary, then the impacts of this will need to scoped in to the ES.

11.9 The scoping report does not include information on how the cooling water intake arrangement mitigates the risk of impingement, and therefore the impact to the benthos has not been presented. MMO would expect consideration ~~to~~ of this to be presented in the ES, and strongly disagree with the lack of inclusion at this stage.

11.10 Table 8.7 within the scoping report concludes that the fish screen will prevent fish from entering the pipe – the MMO fundamentally disagree with this conclusion at this stage, noting that the project is significantly far from a point where such a conclusion can be reached. The risks associated with impingement, entrainment and entrapment of species within the cooling water system are significant and must be considered by the applicant at the earliest opportunity. Engagement is strongly encouraged with both the MMO, and the Environment Agency.

11.11 It should also be clarified that whilst it may be possible to mitigate fish impingement through the use of specialised screens (such as that which is quoted in the report), the entrainment and impingement of fish eggs, larvae and other plankton will be much more difficult. The MMO would expect the risk of this to be

proportionately assessed, given both: the likelihood that organisms will be entrained and impinged, and the commercial, economic and environmental importance of vulnerable fish receptors. As such, MMO would consider it necessary to seek plankton advice to assess this impact.

11.12 With regard to details regarding mitigation where the cooling water intake is concerned, MMO would expect to see specifications and methodology of the protective wedge wire screen including where inside the cooling pipe this would be placed; the target species that would benefit; evidence that it is effective to the point that is being assumed by the applicant, i.e. that it is effective enough to significantly mitigate against fish impingement. The applicant must provide further detail as to why their selected screen is sufficient in the mitigation of threat to marine life.

11.13 MMO support the applicant's recognition of the Thames Estuary recommended Marine Conservation Zone (rMCZ) as being a potentially relevant marine receptor, particularly given the area's national importance for fish spawning and nursing. MMO recommend continuation of the assumption that the rMCZ should be assessed as if it were a verified MCZ.

11.14 MMO note that the applicant has accurately identified the notable fish receptors smelt (Osmerus eperlanus), herring (Clupea harengus), sprat (Sprattus sprattus), thornback ray (Raja clavata), dover sole (Solea solea), seabass (Dicentrarchus labrax) and sea lamprey (Petromyzon marinus). The applicant has also accurately identified the national importance of the Thames for smelt spawning: indeed, this population is considered the most important in the UK. MMO recommend that the applicant consider specific smelt conservation advice compiled by the Zoological Society of London.

11.15 MMO would expect the applicant to consider the increased vulnerability of European seabass in UK waters, as per UK restrictions on fishing activity, in their consideration of likely significant effects.

11.16 The entire Thames Estuary is also considered to be a very important area for Sole – particularly with regard to spawning activity. This in turn supports one of the most important commercial fisheries in the North Sea region. This stock is also considered to be at risk of reduced reproductive capacity and as such, the MMO expect proportionate consideration of the potential impact of the cooling water outflow on Ssole in the Thames, and the North Sea.

11.17 The baseline environment assessment was informed by data and reports from the Environment Agency (EA), Water Framework Directive (WFD), Cefas and the Thames Estuary Dredge Association (TEDA). Whilst this is a broad range of good material to support the baseline description, MMO note that TEDA data are somewhat dated, and that there could be more relevant up to date material used. These data also refer to the Outer Thames Estuary, which, whilst relevant to a higher level, do not give the best description of the Thames' riverine environment. Nonetheless, the baseline environment description is detailed and accurate

12 Estuarine and Geomorphology & Coastal Processes

12.1 Section 8.7 of the scopnig report discusses water cooling system construction impacts due to sediment disturbance, displacement and removal, sediment suspension and resettlement, and changes to hydrodynamics. The operational phase of the cooling water system also has potential to cause similar effects, and these should also be scoped in and included in the ES.

12.2 Changes to the hydrodynamics from installation of temporary and permanent structures (cooling water pipes) is identified in the context of effects on aquatic ecology (paragraph 8.110). However, changes to the hydrodynamics could also affect riverbank morphology, with potential changes to sediment transport regime and bed level (scour). The MMO expect to see morphology of the riverbank (intertidal and subtidal) to be identified as a receptor and included in the ES.

12.3 Impacts relating to coastal processes that have been explicitly scoped out include saltmarsh assessment and use of what is referred to as an 'existing consented jetty'. Any new or amended jetty structure will need to be considered with respect to coastal processes (see item 13.2 below). Notwithstanding this clarification, table 8.7 provides sufficient justification for these impacts being scoped out and the MMO is largely in agreement with these conclusions (excluding the points above including 11.10). However, impacts on riverbank and riverbed morphology should be scoped in, and the EIA should assess whether there will be far field impacts that could influence the saltmarsh.

12.4 Riverbank morphology and bathymetry should be suitably monitored if impacts are expected to occur as a result of the water-cooling system. PSA analysis will form a useful part of the assessment, however should be complemented by bathymetric surveys.

12.5 The applicant will consider the option for either an air based or water-based cooling system, and MMO expect this decision to be informed by the outcomes of the EIA. This embeds mitigation into the project design process.

12.6 Monitoring and mitigation may be required if the water-cooling system is selected; this is not covered in the scoping document but should be addressed in the ES. If the development includes a cooling water system, then impacts on riverbank and bed morphology should be scoped in and assessed appropriately within the EIA. The proposed assessment of effects on aquatic ecology is focussed on construction impacts. This should be extended to consider operational impacts of the cooling water system on sediment disturbance, displacement/removal of seabed sediments, sediment suspension and resettlement.

13 Navigation

13.1 The MMO expect consideration to be given to navigation and other users of the sea, given that the proposal includes marine works (specifically construction of a jetty and potential use of barges). Given the quantity of material to be brought onto site, it is concerning that this has not been addressed under sections 8.41-8.52 of the scoping report.

13.2 It is the MMO's understanding that the jetty proposed (item K, Site Plan Development Zones) is a Thames Tideway Tunnel (TTT)-related structure and during licensing (MLA/2017/00055), it was stated that 'The jetty itself has been designed as a temporary structure and is expected to operate for 5 years for the Tideway project before being decommissioned.' We are also aware that the corresponding licence covering this structure (L/2017/00214/1) includes proposals for its decommissioning. There are a number of outstanding questions to be answered with respect to the jetty; if works are planned before the end of the TTT-jetty use, how will access be coordinated so as to avoid navigational risk and, more broadly, in order to reduce conflict between legitimate users of the sea? Conversely, if works are set to extend beyond the period where the Jetty is being used by the TTT project, what provision is in place to use the jetty for access (noting that the current structure is due to be decommissioned after TTT use).

13.3 The Maritime Coastguard Agency, local harbour authority and local boating/yacht clubs all may wish to comment on potential navigational issues relating to the project.

14 Health Impacts

14.1 The MMO welcomes the intention to consider potential impacts to Human Health in respective topics within the ES (for example air quality & contamination), rather than a separate chapter, due to the lack of potential for impacts given the nature, scale and location of the project.

15 Traffic & Transport

15.1 The MMO welcomes the approach to assess potential impacts from traffic and transport during construction and operation of the proposed works. The Local Planning Authority and Department for Transport may wish to comment.

15.2 As discussed in section 13.1 of this report, given the quantity of material to be brought onto site, it is concerning that use of the jetty for barge access has not been addressed under sections 8.41-8.52 of the scoping report.

16 Climate Change

16.1 The MMO welcomes the approach to carry out assessments on the potential impacts from greenhouse gas emissions through construction and operation of the proposed works, as discussed in sections 8.190-8.197 of the scoping report.

16.2 The MMO note that reference is not made to the forthcoming updated climate change predictions under UKCP18. UKCP09 (and its forthcoming replacement UKCP18) are an important source of data to inform climate change resilience. This should be borne in mind going forward and a precautionary approach should be taken with regards to ‘worst case’ coastal process / flood risk impacts considered with respect to the site operating throughout periods of climate change.

17 Water Resources & Flood Risk

17.1 The MMO welcomes the scope of assessments in relation to potential impacts to water quality, groundwater & risk of flooding as a result of the proposals. For further comment on these matters, MMO defers to the Environment Agency.

17.2 As discussed in section 16.2 of this report, a precautionary approach should be taken with regards to 'worst case' coastal process / flood risk impacts considered with respect to the site operating throughout periods of climate change.

18 Cumulative Impacts & In-Combination Impacts

18.1 The MMO welcomes the approach to carry out a Cumulative Effects Assessment in order to assess impacts from incremental changes caused by other projects in the vicinity of these works. There is likely to be significant stress introduced into the marine environment with this proposal.

18.2 There are a number of activities which may coincide in their introduction of stress into the marine environment, both in the immediate vicinity and in the wider Thames Estuary. Those in the immediate vicinity include:

- Cement works jetty at Frog Island, Dagenham
- Tilbury Power Station
- Tilbury Terminal 2
- Rainham Jetty, Essex
- Belvedere Energy Park, Bexley

19 Risk of Major Accidents and Disasters Relevant to the Project

19.1 The MMO would expect to see a full consideration in the ES, of how the surrounding environment would be impacted should a major accident/disaster, which is not within Thurrock Power Ltd's control, destroy or damage the facility, for example as a result of a tidal surge.

20 Planning Context

20.1 In relation to cooling options, Sections 3.24-3.27 of the scoping report state that "The applicant may select a preferred solution during subsequent stages of the pre-application process, may seek development consent for both options within the project design envelope, or may make a local authority Town and Country Planning Act application outside the DCO consenting regime for the cooling water connection as 'associated development". The MMO note that in order for the project to be fully assed in its entirety then all potential options must be assessed with the ES (and design envelope). The approach described within the EIA scoping report is in conflict with the 'project as a whole' approach to EIA; given the potential significance of marine-impacts if direct cooling via The Thames is taken forward, this needs to form part of the overall ES.

20.2 Section 1.16 of the scoping report details the consultation carried out to-date. No MMO consultation has been carried out prior to this stage, which is concerning given the MMO is a key regulator for activities taking place below MHWS. If a cooling

water intake and access (through a jetty, for example) is required, there may be significant challenges to overcome and the lack of prior discussion is therefore a concern.

21 Conclusion

21.1 The topics highlighted in this scoping opinion must be assessed during the EIA process and the outcome of these assessments **must** be documented in the ES in support of the application. This statement, however, should not necessarily be seen as a definitive list of all EIA requirements. Given the scale and programme of these planned works other work may prove necessary.

21.2 Although a number of elements have been raised throughout this document which must be taken into account at EIA/ES stage, MMO have a number of particular concerns – namely, the risks posed to fisheries species through the potential cooling-water system, and the claims that fish will be prevented from entering the cooling water system; as described above, it is MMO's stance that the project is a significant way from reaching this conclusion.

21.3 Further concerns remain regarding the lack of an approach to MMO with regard to informing the scope of thermal / chemical modelling for the cooling water system.

21.4 Interaction with the MMO at the earliest opportunity is recommended, in order to attempt to resolve these and other key issues.



Jamie Short
Marine Licensing Case Officer
7 September 2018

From: Helen Croxson [mailto:[redacted]]
Sent: 05 September 2018 15:31
To: Thurrock FPG
Cc: Thomas Bulpit
Subject: Re: EN010092-000018 Thurrock Power Ltd

Dear Emma,

Thank you for your letter dated 10 August 2018 inviting the Maritime and Coastguard Agency (MCA) to comment on the Scoping consultation on the Thurrock Flexible Generation Plant.

From the information provided, it appears that the only aspects for MCA to consider would be with regards to the safety of navigation should any infrastructure or works be required in or over the marine environment, and the impact of the works on any MCA infrastructure in the area, which on initial inspection is unlikely.

Should any works be required in or over the marine environment, a Marine Licence may be required under the Marine and Coastal Access Act 2009, at which time the MCA will be invited to comment on the licence application from a navigation safety perspective. In addition, the MCA would point the developers in the direction of the Port Marine Safety Code (PMSC) and its Guide to Good Practice; they would need to liaise and consult with any relevant Port/Harbour Authority to develop a robust Safety Management System (SMS) for the project under this code.

Yours sincerely,

Helen

Maritime & Coastguard Agency

Helen Croxson, Offshore Renewables Advisor
Navigation Safety Branch, Bay 2/25
Maritime & Coastguard Agency
Spring Place, 105 Commercial Road, Southampton, SO15 1EG
Tel: 0203 8172426
[redacted]

From: NATS Safeguarding [mailto:NATSSafeguarding@nats.co.uk]
Sent: 14 August 2018 15:30
To: Thurrock FPG
Subject: RE: EN010092 - Thurrock Flexible Generation Plant - EIA Scoping Notification and Consultation [Our Ref: SG26698]

The proposed development has been examined from a technical safeguarding aspect and does not conflict with our safeguarding criteria. Accordingly, NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal.

However, please be aware that this response applies specifically to the above consultation and only reflects the position of NATS (that is responsible for the management of en route air traffic) based on the information supplied at the time of this application. This letter does not provide any indication of the position of any other party, whether they be an airport, airspace user or otherwise. It remains your responsibility to ensure that all the appropriate consultees are properly consulted.

If any changes are proposed to the information supplied to NATS in regard to this application which become the basis of a revised, amended or further application for approval, then as a statutory consultee NERL requires that it be further consulted on any such changes prior to any planning permission or any consent being granted.

Yours Faithfully

NATS Safeguarding

D: 01489 444687
E: NATSSafeguarding@nats.co.uk

4000 Parkway, Whiteley,
Fareham, Hants PO15 7FL
www.nats.co.uk

Please note: We have recently made some changes to our mailbox structure, I would be grateful if you could delete previous instances of our email address (e.g. in outlook email address auto-fill) and re-typing NATSSafeguarding@nats.co.uk to ensure that the correct inbox is picked up

From: Thurrock FPG [mailto:ThurrockFPG@pins.gsi.gov.uk]
Sent: 10 August 2018 10:58
Subject: EN010092 - Thurrock Flexible Generation Plant - EIA Scoping Notification and Consultation

Mimecast Attachment Protection has deemed this file to be safe, but always exercise caution when opening files.

Date: 07 September 2018
Our ref: 255103
Your ref: EN010092-000018

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

Emma Cottam MRTPI, EIA and Land Rights Advisor
The Planning Inspectorate
ThurrockFPG@pins.gsi.gov.uk

BY EMAIL ONLY

Dear Ms Cottam,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11

Application by Thurrock Power Ltd (the Applicant) for an Order granting Development Consent for the Thurrock Flexible Generation Plant (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Location: Land adjacent to national Grid substation, Tilbury

Thank you for seeking our advice on the scope of the Environmental Statement (ES) in your consultation dated 10 August 2018 which we received on the same date.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Case law[1] and guidance[2] has stressed the need for a full set of environmental information to be available for consideration prior to a decision being taken on whether or not to grant planning permission. Annex A to this letter provides Natural England's general advice on the scope of the Environmental Impact Assessment (EIA) for this development.

Given the scale and type of this proposal, we offer the following bespoke advice which we hope is helpful, to complement the general advice we provide in Annex A.

General Principles
We understand from *EIA Scoping Report for Thurrock Flexible Generation Plant* authored by RPS Group (dated July 2018, revision 8, hereafter referred to as 'The EIA Scoping Report') that the proposal "potentially" may include a cooling water pipeline to the River Thames. As the proposal has yet to be refined in this regard, we advise that the EIA will need to cover all possible impacts on presumption that the cooling pipe is installed. Once the proposal is refined, then the scope of the EIA can be adjusted accordingly.

We draw your attention to the National Policy Statement for Energy EN-1: in particular to paragraph 5.3.4 that the project should seize opportunities to conserve and enhance biodiversity and

[1] Harrison, J in *R. v. Cornwall County Council ex parte Hardy* (2001)
[2] *Note on Environmental Impact Assessment Directive for Local Planning* Authorities Office of the Deputy Prime Minister (April 2004) available from http://webarchive.nationalarchives.gov.uk/+/http://www.communities.gov.uk/planningandbuilding/planning/sustainabilityenvironmental/environmentalimpactassessment/noteenvironmental/

geological conservation interests. The immediate proximity of the proposed development boundary holds considerable nature conservation interest, some of which has been assessed as being of national or international importance (whether this is formally designated or otherwise). In the context of the Tilbury cluster of NSIPs we refer you to the relevant case files for the Tilbury2 port expansion, and Natural England representations made, in particular on terrestrial invertebrates and passage and overwintering birds.

We would expect that this proposal should offer net environmental gains, consistent with paragraph 118 of the recently revised National Planning Policy Framework. Opportunities should be sought not only to avoid, mitigate, and where necessary compensate for impacts on important environmental features but also to deliver net gains for the environment through intelligent site design.

Information requirements

There are a number of matters that are proposed to be 'Scoped Out', as shown in Tables 7.2 & 8.5, that we believe should be 'Scoped in' to the ES, plus other additional information we believe is required in the ES (further comments are set out below):

1. Common Land: management objectives and outcomes for any mitigation land;
2. Wintering bird surveys (especially linked to functionally linked land);
3. Operational Impacts of the water cooling pipe;
4. Protected Species surveys: to be reviewed in the context of the potential water cooling pipe option;
5. Saltmarsh; and
6. Use of the existing/consented jetty.

1. *Common Land.* We note that the proposal includes the loss of an area of common land known as Walton Common. We understand that there has been a consultation process with the local community regarding implications for Walton Common with respect to the proposal, and that a land exchange[3] is under discussion (paragraph 8.55 of the EIA Scoping Report). We advise that land being offered as replacement ("exchange land" in the EIA Scoping Report) should be of least equal value when compared to the land being replaced, in the context of (amongst other matters) the public interest[4]. The EIA should consider the planned land management objectives for such mitigation land as there may be valuable opportunities to provide enhancement such as replacement meadow seeding to provide nectar for pollinators. The compatibility of common land mitigation and other ecological mitigation requirements should be carefully examined.

2. *Wintering bird surveys.* Regarding the cooling pipe option, we have previously advised the applicant via Andrew Troup (an agent acting on behalf of the Applicant) through our Discretionary Advice Service. In essence Natural England was seeking a specific proposal for us to consider regarding the cooling pipe and associated ecological data requirements to inform an impact assessment. We welcome the intention (stated in the EIA Scoping Report at para 8.101 point two) to avoid undertaking potential works during the sensitive period. Given our advice to Mr Troup of 18 July 2018 that *"impacts to over-wintering birds in this area of the Thames foreshore are sensitive given the number of projects in the area, similar data requirements, and cumulative / in-combination effects"* it is important that appropriate evidence and analysis is included in the ES to inform the assessment under the Habitats Regulations. Therefore we advise that survey of wintering birds should include the other areas of development (such as farmland crossed by the gas connection pipe, and access routes) and not just the water cooling pipe vicinity, because these habitats may provide a functional linkage to the adjacent SPA and Ramsar site, and thus are relevant to the HRA and EIA. It is important that the EIA and Habitats Regulations Assessment consider impacts upon both the European site itself and on functionally linked land utilised by SPA birds. Wintering birds associated with adjacent SPA / Ramsar sites are widely known to use e.g. adjacent farmland habitats, and so it is currently unclear on what basis the conclusions of Table 8.5 have been reached (species may include Brent geese, golden plover, lapwing, depending on crop types and management patterns). It should be noted

[3] Appropriate legal advice should be sought regarding any such transfer of land.
[4] The public interest is defined in law under the Commons Act 2006: it is the public interest in nature conservation, landscape and access and archaeology.

that the Thames Estuary and Marshes SPA is also notified for its waterbird assemblage, in addition to the specific named qualifying species. Natural England currently disagrees with Table 8.5 on passage and wintering birds.

3. *Operational Impacts of the water cooling pipe*. We welcome the points raised at paragraph 8.101 of the EIA Scoping Report regarding LSE and impacts to the aquatic environment of the Thames Estuary and Marshes SPA / Ramsar site during the operational phase of the water cooling pipe. However information should also be provided within the ES the regarding operational impacts for access and maintenance of the water cooling pipe. This might usefully include timings of proposed maintenance (and whether these avoid the sensitive period for the SPA bird interest) together with information of working protocols to be used in the case of emergency repair or similar works to water cooling pipe.

4. *Protected Species surveys.* It is not clear to us whether the preliminary species surveys that are referenced in the EIA Scoping report include consideration of the cooling pipe option. Natural England advises that surveys should cover the whole area of development (i.e. including an appropriate corridor of the cooling pipeline option) or present compelling reasons why such surveys are not required. We also advise that the applicant should consult Natural England's published guidance for protected species licencing.

   Currently the methodology of the surveys proposed (e.g. for passage and wintering birds) is not sufficiently detailed for Natural England to agree that these will be fit for the purpose of HRA and EIA assessments (with reference to table 8.4). We strongly recommend that our pre-application DAS service is used to agree evidence requirements for the project.

5. *Saltmarsh*. The summary statement in Table 8.7 is not sufficiently detailed to allow Natural England to agree that the impacts to saltmarsh habitat may be scoped out. There is potential that works to install a water cooling pipe would release sediments which could smother saltmarsh habitats, and therefore saltmarsh should be scoped in).

6. *Use of the existing/consented jetty*. Further justification for the scoping out of impacts arising from use of the existing jetty should be provided, to evidence the assertion in Table 8.7 that it is limited and temporary relative to existing permitted usage.

Designated Sites

Please note that the nationally significant invertebrate assemblage on the adjacent Tilbury2 site could be considered to be of sufficient quality to meet the designation requirements of a Site of Special Scientific Interest ('SSSI'). Natural England is currently considering such a site for notification. We will be adding the site to our SSSI designations' pipeline in due course, consistent with the requirements of our designations' strategy. We will advise further as this progresses but consideration of impacts both alone and cumulative with other developments on these invertebrate assemblages will be necessary to meet the requirements of EIA.

Given the potential water cooling pipe option, and how this interacts with the Thames Estuary and Marshes SPA/Ramsar and South Thames Estuary and Marshes SSSI, we advise that the applicant should contact the Marine Management Organisation (MMO) in the first instance to discuss the requirements of a marine licence https://www.gov.uk/topic/planning-development/marine-licences Projects either entirely or partially below the mean high water mark are likely to require a marine licence.

Habitats and Species of Principal Importance

We note that a scoping exercise has been undertaken by Colin Plan Associates regarding invertebrate interest, and are broadly comfortable with the recommended mitigation (hedgerow retention, bee bank construction, etc). This is important given the nationally significant invertebrate interest in the locality of the adjacent power station (both within the power station site itself and in surrounding suitable habitats).

Cumulative and in-combination effects
The scale of development proposed in this area requires careful consideration of both temporary and permanent in-combination impacts. The EIA will need to consider impacts on existing environmental features, previous mitigation commitments of the land within and adjacent to the development and any mitigation and compensation schemes that are required enable the delivery of other development coming forward in this locality. We would advise that one approach would be the preparation of a co-ordinated mitigation strategy would be agreed between the applicants for this site and nearby developments which would safeguard and join up important environmental features and provide enhancement at the landscape scale.

We agree with the Tier 1 and 2 developments listed in para 6.58 with the potential for cumulative effects, although the applicant may find it helpful to consult Thurrock Council for other relevant projects to include.

Administrative correction: We note that in Table 1.1 of the EIA Scoping Report that Mr Jonathan Bustard is listed as representing Natural England and the Essex Wildlife Trust. Mr Bustard only represents Natural England, and we recommend that the applicant consult with Essex Wildlife Trust if they have not already done so.

Should the proposal be amended in a way which significantly affects its impact on the natural environment then, in accordance with Section 4 of the Natural Environment and Rural Communities Act 2006, Natural England should be consulted again.

Natural England anticipates further dialogue with the developer through our DAS service, to progress some of the items mentioned above, and to discuss a programme of further review of draft documents ahead of formal submission. We would be happy to comment further should the need arise but if in the meantime you have any queries please do not hesitate to contact us. For any queries relating to the specific advice in this letter only please contact Steve Roe on 0208 2257685. For any new consultations, or to provide further information on this consultation please send your correspondences to consultations@naturalengland.org.uk.

Yours sincerely

Steve Roe
Lead Adviser – Land Use Planning, West Anglia Area Team

Annex A – Advice related to EIA Scoping Requirements

1. General Principles

Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2017, sets out the necessary information to assess impacts on the natural environment to be included in an ES, specifically:

- A description of the development – including physical characteristics and the full land use requirements of the site during construction and operational phases.
- Expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.
- An assessment of alternatives and clear reasoning as to why the preferred option has been chosen.
- A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.
- A description of the likely significant effects of the development on the environment – this should cover direct effects but also any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects. Effects should relate to the existence of the development, the use of natural resources and the emissions from pollutants. This should also include a description of the forecasting methods to predict the likely effects on the environment.
- A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
- A non-technical summary of the information.
- An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

It will be important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals and a thorough assessment of the 'in combination' effects of the proposed development with any existing developments and current applications. A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.

2. Biodiversity and Geology

2.1 Ecological Aspects of an Environmental Statement

Natural England advises that the potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance on such matters. Guidelines for Ecological Impact Assessment (EcIA) have been developed by the Chartered Institute of Ecology and Environmental Management (CIEEM) and are available on their website.

EcIA is the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components. EcIA may be carried out as part of the EIA process or to support other forms of environmental assessment or appraisal.

The National Planning Policy Framework sets out guidance in S.118 on how to take account of biodiversity interests in planning decisions and the framework that local authorities should provide to assist developers.

2.2 Internationally and Nationally Designated Sites

The ES should thoroughly assess the potential for the proposal to affect designated sites. European sites (e.g. designated Special Areas of Conservation and Special Protection Areas) fall within the scope of the Conservation of Habitats and Species Regulations 2017. In addition paragraph 118 of the National Planning Policy Framework requires that potential Special Protection Areas, possible Special Areas of Conservation, listed or proposed Ramsar sites, and any site

identified as being necessary to compensate for adverse impacts on classified, potential or possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites.

Under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 an appropriate assessment needs to be undertaken in respect of any plan or project which is (a) likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site.

Should a Likely Significant Effect on a European/Internationally designated site be identified or be uncertain, the competent authority (in this case the Local Planning Authority) may need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process.

Sites of Special Scientific Interest (SSSIs) and sites of European or international importance (Special Areas of Conservation, Special Protection Areas and Ramsar sites)
The development site is near the following designated nature conservation site(s):

- Thames Estuary and Marshes SPA/Ramsar
- South Thames Estuary and Marshes SSSI (~2.8km to the south-east)
- Mucking Flats and Marshes SSSI (~2.5km to the east)
- Hangman's Wood and Deneholes SSSI (~4km, to the north-west)

Further information on the SSSI and its special interest features can be found at www.magic.gov . The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within these sites and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects.

Natura 2000 network site conservation objectives are available on our internet site http://publications.naturalengland.org.uk/category/6490068894089216

2.3 Regionally and Locally Important Sites
The EIA will need to consider any impacts upon local wildlife and geological sites. Local Sites are identified by the local wildlife trust, geoconservation group or a local forum established for the purposes of identifying and selecting local sites. They are of county importance for wildlife or geodiversity. The Environmental Statement should therefore include an assessment of the likely impacts on the wildlife and geodiversity interests of such sites. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures. Contact the local wildlife trust, geoconservation group or local sites body in this area for further information.

2.4 Protected Species - Species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017
The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newts, reptiles, birds, water voles, badgers and bats). Natural England does not hold comprehensive information regarding the locations of species protected by law, but advises on the procedures and legislation relevant to such species. Records of protected species should be sought from appropriate local biological record centres, nature conservation organisations, groups and individuals; and consideration should be given to the wider context of the site for example in terms of habitat linkages and protected species populations in the wider area, to assist in the impact assessment.

The conservation of species protected by law is explained in Part IV and Annex A of Government Circular 06/2005 *Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System*. The area likely to be affected by the proposal should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES.

In order to provide this information there may be a requirement for a survey at a particular time of year. Surveys should always be carried out in optimal survey time periods and to current guidance

by suitably qualified and where necessary, licensed, consultants. Natural England has adopted standing advice for protected species which includes links to guidance on survey and mitigation.

2.5 Habitats and Species of Principal Importance
The ES should thoroughly assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List, published under the requirements of S41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act 2006 places a general duty on all public authorities, including local planning authorities, to conserve and enhance biodiversity. Further information on this duty is available here https://www.gov.uk/guidance/biodiversity-duty-public-authority-duty-to-have-regard-to-conserving-biodiversity.

Government Circular 06/2005 states that Biodiversity Action Plan (BAP) species and habitats, 'are capable of being a material consideration…in the making of planning decisions'. Natural England therefore advises that survey, impact assessment and mitigation proposals for Habitats and Species of Principal Importance should be included in the ES. Consideration should also be given to those species and habitats included in the relevant Local BAP.

Natural England advises that a habitat survey (equivalent to Phase 2) is carried out on the site, in order to identify any important habitats present. In addition, ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year, to establish whether any scarce or priority species are present. The Environmental Statement should include details of:

- Any historical data for the site affected by the proposal (e.g. from previous surveys);
- Additional surveys carried out as part of this proposal;
- The habitats and species present;
- The status of these habitats and species (e.g. whether priority species or habitat);
- The direct and indirect effects of the development upon those habitats and species;
- Full details of any mitigation or compensation that might be required.

The development should seek if possible to avoid adverse impact on sensitive areas for wildlife within the site, and if possible provide opportunities for overall wildlife gain.

The record centre for the relevant Local Authorities should be able to provide the relevant information on the location and type of priority habitat for the area under consideration.

2.6 Contacts for Local Records
Natural England does not hold local information on local sites, local landscape character and local or national biodiversity priority habitats and species. We recommend that you seek further information from the appropriate bodies (which may include the local records centre, the local wildlife trust, local geoconservation group or other recording society and a local landscape characterisation document).

3. Designated Landscapes and Landscape Character

Nationally Designated Landscapes
As the development site is within/adjacent to Kent Downs Area of Outstanding Natural Beauty (AONB), consideration should be given to the direct and indirect effects upon this designated landscape and in particular the effect upon its purpose for designation within the environmental impact assessment, as well as the content of the relevant management plan for this AONB.

Landscape and visual impacts
Natural England would wish to see details of local landscape character areas mapped at a scale appropriate to the development site as well as any relevant management plans or strategies pertaining to the area. The EIA should include assessments of visual effects on the surrounding area and landscape together with any physical effects of the development, such as changes in topography. The European Landscape Convention places a duty on Local Planning Authorities to

consider the impacts of landscape when exercising their functions.

The EIA should include a full assessment of the potential impacts of the development on local landscape character using landscape assessment methodologies. We encourage the use of Landscape Character Assessment (LCA), based on the good practice guidelines produced jointly by the Landscape Institute and Institute of Environmental Assessment in 2013. LCA provides a sound basis for guiding, informing and understanding the ability of any location to accommodate change and to make positive proposals for conserving, enhancing or regenerating character, as detailed proposals are developed.

Natural England supports the publication *Guidelines for Landscape and Visual Impact Assessment*, produced by the Landscape Institute and the Institute of Environmental Assessment and Management in 2013 (3rd edition). The methodology set out is almost universally used for landscape and visual impact assessment.

In order to foster high quality development that respects, maintains, or enhances, local landscape character and distinctiveness, Natural England encourages all new development to consider the character and distinctiveness of the area, with the siting and design of the proposed development reflecting local design characteristics and, wherever possible, using local materials. The Environmental Impact Assessment process should detail the measures to be taken to ensure the building design will be of a high standard, as well as detail of layout alternatives together with justification of the selected option in terms of landscape impact and benefit.

The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England advises that the cumulative impact assessment should include other proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning application.

The assessment should refer to the relevant National Character Areas which can be found on our website. Links for Landscape Character Assessment at a local level are also available on the same page.

Heritage Landscapes
You should consider whether there is land in the area affected by the development which qualifies for conditional exemption from capital taxes on the grounds of outstanding scenic, scientific or historic interest. An up-to-date list may be obtained at www.hmrc.gov.uk/heritage/lbsearch.htm.

4. Access and Recreation
Natural England encourages any proposal to incorporate measures to help encourage people to access the countryside for quiet enjoyment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure. Relevant aspects of local authority green infrastructure strategies should be incorporated where appropriate.

Rights of Way, Access land, Coastal access and National Trails
The EIA should consider potential impacts on access land, public open land, rights of way and coastal access routes in the vicinity of the development. Consideration should also be given to the potential impacts on any nearby National Trail. The National Trails website www.nationaltrail.co.uk provides information including contact details for the National Trail Officer. Appropriate mitigation measures should be incorporated for any adverse impacts. We also recommend reference to the relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced.

5. Soil and Agricultural Land Quality

Impacts from the development should be considered in light of the Government's policy for the protection of the best and most versatile (BMV) agricultural land as set out in paragraph 112 of the NPPF. We also recommend that soils should be considered under a more general heading of sustainable use of land and the ecosystem services they provide as a natural resource in line with paragraph 109 of the NPPF.

Soil is a finite resource that fulfils many important functions and services (ecosystem services) for society, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution. It is therefore important that the soil resources are protected and used sustainably.

The applicant should consider the following issues as part of the Environmental Statement:

1. The degree to which soils are going to be disturbed/harmed as part of this development and whether 'best and most versatile' agricultural land is involved.

   This may require a detailed survey if one is not already available. For further information on the availability of existing agricultural land classification (ALC) information see www.magic.gov.uk. Natural England Technical Information Note 049 - *Agricultural Land Classification: protecting the best and most versatile agricultural land* also contains useful background information.

2. If required, an agricultural land classification and soil survey of the land should be undertaken. This should normally be at a detailed level, eg one auger boring per hectare, (or more detailed for a small site) supported by pits dug in each main soil type to confirm the physical characteristics of the full depth of the soil resource, ie 1.2 metres.

3. The Environmental Statement should provided details of how any adverse impacts on soils can be minimised. Further guidance is contained in the *Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites*.

As identified in the NPPF new sites or extensions to new sites for peat extraction should not be granted permission by Local Planning Authorities or proposed in development plans.

6. Air Quality

Air quality in the UK has improved over recent decades but air pollution remains a significant issue; for example over 97% of sensitive habitat area in England is predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition (England Biodiversity Strategy, Defra 2011). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The planning system plays a key role in determining the location of developments which may give rise to pollution, either directly or from traffic generation, and hence planning decisions can have a significant impact on the quality of air, water and land. The assessment should take account of the risks of air pollution and how these can be managed or reduced. Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (www.apis.ac.uk). Further information on air pollution modelling and assessment can be found on the Environment Agency website.

7. Climate Change Adaptation

The England Biodiversity Strategy published by Defra establishes principles for the consideration of biodiversity and the effects of climate change. The ES should reflect these principles and identify how the development's effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment 'by establishing coherent ecological networks that are more resilient to current and future pressures' (NPPF Para 109), which should be demonstrated through the ES.

8. Contribution to local environmental initiatives and priorities

The Thames Estuary and Marshes Focus Area
This site falls within Natural England's Thames Estuary and Marshes Focus Area. Part of the reason for the selection of this area are the important brownfield sites and habitats and species listed as being of principal importance for the purpose of conserving biodiversity, under section 41 of the Natural Environment and Rural Communities Act 2006 and, in particular its rich invertebrate assemblages.

9. Cumulative and in-combination effects

A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.

The ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. The following types of projects should be included in such an assessment, (subject to available information):

a. existing completed projects;
b. approved but uncompleted projects;
c. ongoing activities;
d. plans or projects for which an application has been made and which are under consideration by the consenting authorities; and
e. plans and projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.

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SUBMITTED ELECTRONICALLY:
ThurrockFPG@pins.gsi.gov.uk

06 September 2018

Dear Sir/Madam

RE: Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations) – Regulations 10 and 11

Application by Thurrock Power Ltd (the Applicant) for an Order granting Development Consent for the Thurrock Flexible Generation Plant (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

This is a response on behalf of National Grid Electricity Transmission PLC (NGET)

I refer to your letter dated 10th August 2018 regarding the proposed Order. NGET wish to express their interest in further consultation while the impact on our assets is still being assessed.

National Grid are in regular contact with Thurrock Power ltd and National Grid will continue to liaise with the developer throughout the progression of this proposed development.

Please see relevant guidance for working near NGET assets below.

Where the Promoter intends to acquire land, extinguish rights, or interfere with any of NGET's apparatus, both will require appropriate protection and further discussion on the impact to its apparatus and rights.

National Grid is a trading name for:
National Grid Electricity Transmission plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2366977

National Grid is a trading name for:
National Grid Gas plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2006000

National Grid house
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

Specific Comments – Electricity Infrastructure:

- National Grid's Overhead Line/s is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset

- Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. National Grid recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "overhead line clearances Issue 3 (2004).

- If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances.

- The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines" and all relevant site staff should make sure that they are both aware of and understand this guidance.

- Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum "sag" and "swing" and overhead line profile (maximum "sag" and "swing") drawings should be obtained using the contact details above.

- If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances.

- Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or "pillars of support" of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation ("pillar of support") drawings can be obtained using the contact details above.

- National Grid Electricity Transmission high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. These provisions provide National Grid full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with National Grid prior to any works taking place.

- Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented.

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National Grid house
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CV34 6DA

Technical information and guidance documents mentioned above in regards to National Grid's apparatus can be found at:

https://www.nationalgrid.com/uk/about-grid/our-networks-and-assets/land-planning-and-development

I hope the above information is useful. If you require any further information please do not hesitate to contact me.

Yours sincerely

[redacted]

Spencer Jefferies
Development Liaison Officer, Land and Acquisitions.

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From: Helena Payne [mailto:Helena.Payne@pla.co.uk]
Sent: 07 September 2018 13:41
To: Thurrock FPG
Cc: Lucy Owen; James Trimmer
Subject: EN010092-000018 - Scoping consultation in respect of the application by Thurrock Power Ltd for an Order Granting Development Consent for the proposed Thurrock Flexible Generation Plant. Port of London Authority Response.

FAO: Emma Cottam

Dear Emma

Thank you for consulting the Port of London Authority (PLA) on the Regulation 10 and 11 Scoping Report in support of the proposed Thurrock Flexible Generation Plant. I have now had the opportunity to review the submitted document and provide the following observations in respect to it's content:

General

The PLA's first observation relates to pre-application discussion, which disappointingly the PLA has not been party too to date. This is made even more disappointing given the red line development boundary includes the River Thames, of which the PLA is Harbour Authority. The PLA is the statutory body responsible for the conservancy of the River Thames ("the River") and the administration of navigation on, and works and dredging in, under or over, the River. Its area of jurisdiction and regulatory powers are mainly in the Port of London Act 1968.

The red line boundary shown on the submitted plans includes an area of the River, which is within the PLA's jurisdiction (and which is owned by the PLA). The extension of the red line into the River allows the Applicant to consider the option of water cooling using water from the Thames (considered further under Water Resources/Hydrographic Matters). Given the impact this may have on the River, it is surprising that the scoping report does not refer to the need for a Licence under s.66 of the Port of London Act, 1968, which relates to consenting river works. This is especially relevant in connection with the proposed cooling pipes required for this scheme and potential on-going maintenance and use of the existing jetty. The PLA expect this to be addressed within the forthcoming Environmental Statement (ES). It is also unclear whether these works within the River will either form part of the Development Consent Order (DCO) or whether the DCO will make alternative provision and disapply the requirement for a River Works Licence. The PLA has not had ~~any~~ discussions with the Applicant on this to date, and therefore must reserve its position on this matter until discussions have taken place.

Marine Ecology

The PLA advise that the Applicant recheck the status of the Marine Conservation Zone (MCZ) as the Tranche 3 consultation has now closed and there is a revised (much smaller) boundary for the now proposed MCZ. The Applicant's assessments may have been undertaken prior to this change, however it may be worth checking this point, as it could potentially minimise the scope of the assessment going forward. The revised boundary is available on the MAGIC website (https://magic.defra.gov.uk/ - which provides authoritative geographic information about the natural environment).

Coastal Processes

Whilst ecology and flood risk are covered, there does not appear to be much in the way of a coastal processes assessment to support the ecological assessment. If works are to be constructed in the current red line boundary, the PLA would have some serious concerns regarding the impact of an intake/outfall structure on the stability of the intertidal area given its rapid accretion over the last 20 years. Destabilisation of the intertidal area could also impact on the navigation channel and reverse the ecological benefits that have been achieved.

Marine Navigation

At paragraph 3.35 the Applicant has advised that in the construction phases of the development they will consider the option to use barge delivery on the Thames where possible for bulk materials such as aggregates. It is suggested that either the existing jetty and offloading facilities of the land raising option or the consented larger jetty and pontoon (permitted via planning application 17/00224/FULL from the Local Planning Authority) would be used. The PLA fully support use of the River, however a Navigational Risk Assessment (NRA) will be required for use of barges, the jetty and river (especially given any potential overlap with other projects (to be addressed under Cumulative Impacts)), and it is disappointing that further consideration of navigational matters has not been documented. The PLA welcome discussions with the Applicant on these matters as soon as possible.

Air Quality

Given the potential use of the River for the transport of materials during the construction phase of the development, it is surprising that the positive impact (for example reduction of CO2 and resultant reduction of lorry movements) from using barges in the transport of goods has not been included within this section of the scoping report. The PLA expect to see greater emphasis given to this within any forthcoming ES. An assessment of the appropriateness, as a mitigation, of providing shore power should also be included within the ES.

Water Resources/Hydrographic Matters

The scoping report contains very little detail of the cooling option and its assessment. The Applicant should review the riverward extent of the red line boundary as the Ordnance Survey (OS) Mean Low Water (MLW) does not account for the accretion that resulted from the construction of the Diver Shoal groynes 20 years ago. The drying line is currently up to 145m south of the OS MLW.

It is disappointing that the PLA has not been approached in terms of water resources or hydrographic matters. It is noted that supporting data, especially hydrographic data, does not include any sourced from the PLA.

Noise & Vibration

Paragraph 8.131 relates to construction and decommissioning traffic, which the PLA considers must also include ship/barges given the intention to utilise the Thames for the transportation of materials.

Cumulative Impacts

The proposed Order Limits (red line boundary) does not overlap with the RWE's red line boundary, however it does overlap with Lower Thames Crossing's development area boundary. The PLA would have expected greater emphasis and consideration given to the cumulative and in-combination effects of the proposed Generation Plant alongside other developments, including the Nationally Significant Infrastructure Projects (NSIP) at Tilbury 2 and RWE, as well as the Lower Thames Crossing, especially given the proposed timings for commencement of development on all of these sites could potentially overlap, resulting in a cumulative impact of construction traffic on road and river (amongst other matters). This should also be addressed in the forthcoming NRA.

Matters to be scoped out of the ES

Section 9.9 looks at matters to be scoped out of the ES. If river use is not to be scoped in, the PLA expect, at the very least, for it to be addressed within any forthcoming Construction Environmental Management Plan (CEMP), Navigational Risk Assessment (NRA) and River Logistics Plan (RLP), in support of the formal submission.

Conclusions

Overall, the PLA is disappointed not to have been included in discussions regarding the proposal to date. However, notwithstanding this, there are a number of assessments that need to be undertaken, as detailed above. The PLA is willing to engage with the applicant to discuss these matters further.

I hope the above is of assistance to you.

Regards

Helena

Helena Payne
Senior Planner
Port of London Authority

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VINCENT+GORBING

Our ref : MF/5120

05 September 2018

Emma Cottam MRTPI
EIA and Land Rights Advisor
Major Casework Directorate
Temple Quay House
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BS1 6PN

Dear Madam

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations) – Regulations 10 and 11

Application by Thurrock Power Ltd (the Applicant) for an Order granting Development Consent for the Thurrock Flexible Generation Plant (the Proposed Development)

Thank you for consulting our client, Port of Tilbury London Limited ("PoTLL"), regarding the EIA scoping for the above scheme by letter dated 10 August 2018. This letter and the two annexes attached hereto are the response of PoTLL to the Scoping Report.

The comments in this letter are made from the perspective of PoTLL's role as:-

1. The owner and operator of Port of Tilbury
2. The owner and promoter of a new Port Terminal on the western part of the former Tilbury Power Station site (known as Tilbury2) which is the subject of an application prepared, consulted on, assessed and submitted to the Secretary of State in October 2017 (reference TR030003) and subject to examination which formally closed on 20 August 2018.

The Scoping Report for the Thurrock Flexible Generation Plant ("TFGP") was published on 10 August 2018, very shortly before the last timetabled submission deadline and formal close of the Tilbury2 Examination. Despite the timing within the Tilbury2 examination process, PoTLL prepared and submitted a document to the Tilbury2 Examination entitled *"Note On Thurrock Flexible Generation Plant"* [Tilbury2 library reference number REP7-024[i]]. This provided observations on the potential for cumulative effects arising from TFGP with Tilbury2 and two other Nationally Significant Infrastructure Projects in the vicinity, namely Tilbury Energy Centre ("TEC") and Lower Thames Crossing ("LTC"). That document is attached as Annex 1 to this letter and should be seen as forming part of PoTLL's representations to this Scoping consultation.

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Chartered Architects and Town Planners

Attached as Annex 2 to this letter is a detailed analysis of the Scoping Report with respect to ecological matters prepared by PoTLL's consulting ecologists on the Tilbury2 project, Bioscan UK Limited.

Discussions held between PoTLL and Thurrock Power Limited

The Scoping Report states at para. 6.61 that the Applicant *"has worked closely with Highways England, RWE and Port of Tilbury to consider cumulative effects and mitigation requirements or opportunities (such as landscaping and biodiversity enhancement) afforded by some or all of these developments in conjunction and will continue to do so during the EIA process."* PoTLL accept that some limited discussions have occurred with the promotor of TFGP, but these have been at a high level regarding solely the interaction of the TFGP proposals and PoTLL's land interests. No detailed discussions have been held between Thurrock Power Limited and PoTLL as to the interaction of the temporal or geographic scope or potential design of the TFGP or its proposed environmental mitigation at this stage.

Order Limits

The TFGP site lies immediately adjoining the northern part of the Tilbury2 site, with a common boundary some 500m in length. The land within the Tilbury2 Order Limits in this part of the Tilbury2 site is proposed to be used in part for ecological mitigation and remain undeveloped and in part for the construction and aggregates terminal (CMAT).

It is also noted that there would appear to be some minor overlap in the proposed Order Limits boundary for TFGP and the Tilbury2 Order Limits in the area noted as "J" on Figure Number 2 (sheet 1), which is an area identified as "Possible S106 planning gain land." We note that the Order Limits of Tilbury2 in this area were modified at Deadline 5 of the Tilbury2 Examination[ii] and we recommend that the TFGP Applicant reviews their boundary in this area to ensure there is no overlap and that full regard to the proposed as well as existing use is fully taken into account in the baseline and future baseline for assessment.

Construction programme

The Scoping Report sets out the construction period for the TFGP as being from Q1 2021 to Q4 2021.

PoTLL consider that there will be limited, if any, temporal overlap in the anticipated construction programmes of Tilbury2 with TFGP. If the Tilbury2 DCO is granted, Tilbury2 will become operational with the opening of the RoRo terminal in Q1 2020. Construction on-site for the remainder of the terrestrial works including the CMAT would continue for another 12 months (i.e. until Q1 2021).

Assuming construction of TFGP commences at the earliest Q1 2021, all of the main construction activities related to the Tilbury2 proposals (in particular the new lengths of highway and rail line, all maritime infrastructure, and the grading and laying of appropriate pavements across the site) will be complete and the RoRo terminal, and quite possibly the full extent of the CMAT, will be operational.

Indeed, PoTLL consider that the time line set out by the applicants for the TFGP is highly optimistic considering no statutory consultation has been undertaken and the basic level

of environmental information provided in the Scoping Report, combined with the need to participate in the competitive Capacity Market auction process. As such, there are unlikely to be cumulative construction environmental effects between Tilbury2 and TFGP due to construction activities being undertaken for both projects at the same time.

The construction period for TFGP is more likely to overlap with that for TEC should both schemes gain permission and come forward as planned by their respective promotors and there is a possibility that TFGP, TEC and LTC could all be under construction at the same time; but by that time, Tilbury2 will be substantially completed and operational, with environmental mitigation and enhancement areas established and in management and maintenance. The TFGP should however consider fully the potential for both follow on effects of the timing of construction and potential disturbance in newly established environmental mitigation land as well as any potential overlap between their project, TEC and LTC and the change in baseline, future baseline and cumulative effects that could arise from these planned projects.

Approach to Cumulative Effects Assessment and mitigation

The extent of information available within the Scoping Report for TFGP is limited. Cumulative effects of that scheme with Tilbury2 will necessarily be undertaken by the promoter of the TFGP. The Scoping Report states that the potential for cumulative impacts with several other nearby major infrastructure projects that are in the process of applying for development consent has been identified and will be assessed in the EIA. These include Tilbury2, the Lower Thames Crossing and the Tilbury Energy Centre. PoTLL consider this to be the correct approach as they are significant planned projects.

The environmental impacts of TFGP, along with both LTC and TEC will fall to be assessed and considered by the relevant decision-makers as and when applications are progressed through the DCO process. All three have identified in their respective Scoping Reports that Tilbury2 is a cumulative project that will be assessed as part of their Environmental Assessment process.

The Tilbury2 application has progressed through the whole pre-application, application and examination process and the Examining Authority must report to the Secretary of State on or before 20 November 2018 and if submitted on that date the Secretary of State must make a decision on or before 20 February 2019. Therefore by the time TFGP, LTC and TEC applications are fully consulted on, designed and assessed with full regard to that consultation and submitted and accepted for full examination and testing in public through the DCO process, the Tilbury2 DCO may well have been made. If the decision was still to be made, all necessary detail of the Tilbury2 proposals will in any event be available to the promoters of those schemes as already fully published on the Planning Inspectorate website project page for Tilbury2[iii].

This will allow TFGP to fully take account of the environmental assessment, full examination submissions and documentation, detailed design of Tilbury2, any on-going monitoring, and the associated proposed mitigation and the statutory consultee responses to this information. This will ensure that potential cumulative effects will be quantified at the appropriate point and will allow for appropriate, avoidance and minimisation through design and mitigation strategies (in the TFGP, and indeed TEC and LTC proposed schemes) to properly address cumulative effects if these are indeed identified once the detail of these future proposals is known.

The annexed *"Note On Thurrock Flexible Generation Plant"* highlights potential environmental topics where cumulative effects could arise based on the very limited information provided in the scoping report submitted by TFGP. We would particularly highlight to the applicant comments therein on ecology, heritage and landscape and through this submission the water environment should water abstraction, cooling and discharge come forward as part of the TFGP project.

PoTLL has particular concerns regarding ecology, as the TFGP proposals have the potential to interact with impacts from the Tilbury2 project mainly by virtue of geographical proximity and the interconnection between certain habitat and species receptors. In particular, the site proposed for the TFGP itself is subject to a draft Local Wildlife Site designation (LoWS) (although this does not appear to have been identified in the scoping report), and is known to support semi-improved coarse grassland and relict grazing marsh habitats of confirmed value for reptiles and (in the boundary ditches) water voles, and with likely value for ground nesting and scrub birds, badgers and species from the nationally significant invertebrate assemblage associated with the power station area generally, potentially including Priority species such as hornet robberfly.

Thus, further impacts on such resources could arise from the TFGP with additional consequences for local metapopulations over and above those arising from Tilbury2 alone and/or Tilbury2 cumulatively with the TEC and LTC.

Scope of environmental topics

Table 7.2 of the TFGP 'scopes out' a number of topics or aspects of those topics.

PoTLL do not agree that Human Health (as a separate Health Chapter) should be scoped out. It is considered important to prepare a Health Impact Assessment and report this either separately or as a Chapter in the Environmental Statement. An integrated chapter in the ES was the approach taken by PoTLL in the Tilbury2 EIA and accepted by Thurrock Council Public Health.

The ES should clearly identify the location and distance from the development of all human receptors which may be affected by emissions from or activities associated with the Proposed Development during construction, operation and decommissioning. The assessment should particularly address human receptors on site (employees), at residential premises, commercial/industrial premises, transport infrastructure routes (such as roads and railways), schools, medical facilities, recreational/ tourism areas and publicly accessible land. In particular, individuals employed at Tilbury2 should be considered as a receptor of potential effects.

Health determinants should be identified including noise and vibration, air quality (including construction dust), lighting; traffic, transport and connectivity; open space and green space; neighbourhood quality, including landscape and townscape quality, local amenity and 'sense of place'; direct employment and wider economic impacts; education and training; local housing market; access to services; and physical activity.

PoTLL are also unconvinced that 'Waste management' should be scoped out at this stage. From experience at Tilbury2, there are likely to be waste arisings from the scheme as a result of achieving suitable ground conditions for development. Whilst the Scoping Report

indicates that any arisings will be contained within the site, even small arisings could have an environmental effect. As established by the assessment undertaken by PoTLL for the Tilbury2 project, waste capacity in Thurrock is more limited than in the wider Essex area, and therefore the impacts on this capacity from TFGP, particularly when considered cumulatively with Tilbury2, TEC and LTC could be significant.

Detailed comments on the scope of the assessment in respect of ecology are contained in Annex 2 to this letter.

We trust the above comments will be taken into account by the Secretary of State in preparing the Scoping Opinion for the TFGP project.

Yours faithfully

[redacted]

MARTIN FRIEND
DIRECTOR
FOR VINCENT AND GORBING
[redacted]

Enc:

Annex 1 : *Note On Thurrock Flexible Generation Plant* by PoTLL, submitted to the Tilbury2 Examination, August 2018

Annex 2 Additional comments on the Scoping Report in relation to onshore and intertidal ecology by Bioscan UK Limited

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[i] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000990-Note%20on%20Thurrock%20Flexible%20Generation%20Plant.pdf

[ii] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000880-PoTLL%20General%20Arrangement%20Plans%20v2.pdf

[iii] https://infrastructure.planninginspectorate.gov.uk/projects/south-east/tilbury2/?ipcsection=overview

Annex 1 :

Note On Thurrock Flexible Generation Plant **by PoTLL, submitted to theTilbury2 Examination, August 2018**

PORT OF TILBURY LONDON

PLANNING ACT 2008
INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

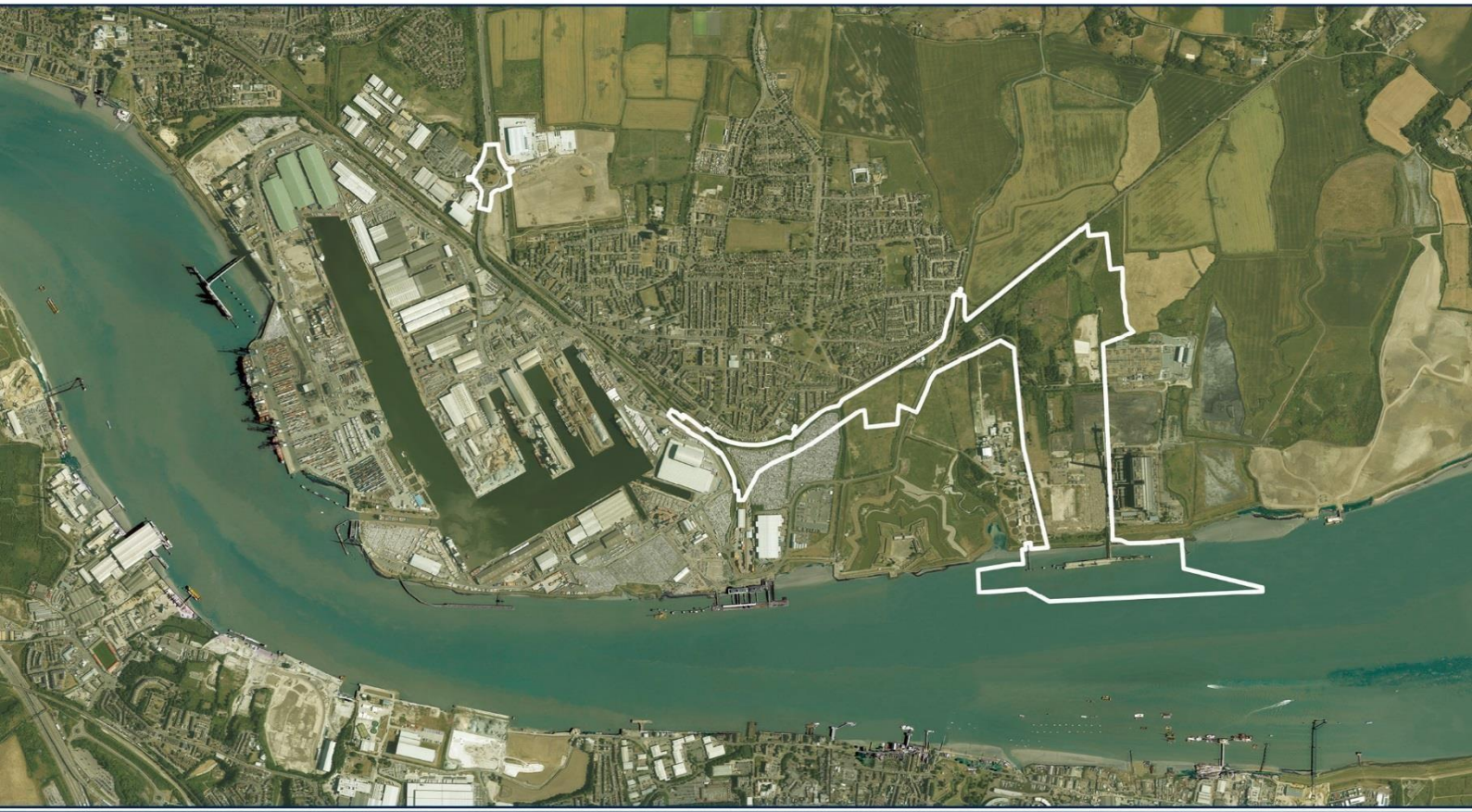
PROPOSED PORT TERMINAL AT FORMER TILBURY POWER STATION

TILBURY2

TR030003

NOTE ON THURROCK FLEXIBLE GENERATION PLANT

TILBURY2 DOCUMENT REF: POTLL/T2/EX/225



TILBURY2

PORT OF TILBURY

PLANNING ACT 2008

PROPOSED PORT TERMINAL AT FORMER TILBURY POWER STATION 'TILBURY2'

NOTE ON THURROCK FLEXIBLE GENERATION PLANT

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1.0 INTRODUCTION

1.1 On 10 August 2018, PoTLL were advised by PINS that under the Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations) – Regulations 10 and 11, a Scoping Consultation had commenced in respect of an application by Thurrock Power Ltd for a proposed Order granting Development Consent for an electricity generating installation known as the Thurrock Flexible Generation Plant ("TFGP").

1.2 The TFGP proposals adjoins the Tilbury2 site. Giving both the timing of this submission (6 working days before the end of the Tilbury2 Examination) and the level of information provided within the Scoping Report (for example a lack of any meaningful visualisations of the proposals), PoTLL consider that undertaking even a high level Qualitative Cumulative Effects Assessment of this proposal with Tilbury2 is not possible or appropriate at this point.

1.3 However, in order to assist the Examining Authority this note has been prepared by PoTLL to provide some high level comments on the potential interaction of the Tilbury2 proposals with the TFGP. This serves as an addendum to the Qualitative Cumulative Effects Assessment of Tilbury2 with Tilbury Energy Centre and Lower Thames Crossing (REP6-006).

1.4 PoTLL would note that the Scoping Report states at para. 6.61 that the Applicant *"has worked closely with Highways England, RWE and Port of Tilbury to consider cumulative effects and mitigation requirements or opportunities (such as landscaping and biodiversity enhancement) afforded by some or all of these developments in conjunction and will continue to do so during the EIA process."* PoTLL accept that some limited discussions have occurred with the promotor of TFGP, but these have been at a high level regarding solely the interaction of the TFGP proposals and PoTLL's land interests. No detailed discussions have been held between Thurrock Power Limited and PoTLL as to the interaction of the design of the TFGP or its proposed environmental mitigation at this stage.

2.0 DESCRIPTION OF THURROCK FLEXIBLE GENERATION PLANT

2.1 The Scoping Report for TFGP[1] indicates that the applicant, Thurrock Power Ltd, proposes to develop a flexible generation plant on land north of Tilbury Substation in Thurrock. The flexible generation plant will provide up to 600 megawatts of electrical generation capacity on a fast response basis when called by the National Grid, together with up to 150 megawatts of battery storage capacity.

2.2 Figures 1 to 3 in the Scoping Report show the proposed development location, application boundary and indicative layout of the flexible generation plant. The 'development boundary' does not cross the Tilbury2 site but immediately adjoins its north east corner.

2.3 The Scoping Report states that the flexible generation plant will comprise reciprocating gas engines, batteries, and associated electrical and control equipment. The scheme proposes a new permanent access road and potential temporary construction access roads, a gas pipeline connection to the gas national transmission system and potentially a cooling water pipeline to the River Thames.

2.4 A preliminary layout for the main development site is shown in Figure 3. The Scoping Report describes that this preliminary layout is subject to change following consultation with stakeholders and ongoing technical and environmental studies, but *"as currently designed shows the expected location and space requirements within the application site of the main development elements - gas engines, batteries, runoff attenuation, substation, and electricity, cooling water and gas connection points - responding to currently known site constraints."* (para. 3.8).

2.5 There is clearly a considerable degree of uncertainty as to the form of the proposals and *"due to the ongoing need for flexibility to accommodate further technical developments, the applicant will also seek to use a Rochdale Envelope approach in the EIA process*." (para. 3.10). Table 3.2 provides an envelope of development which includes items such as gas engines *"up to 60 units contained within four purpose-built buildings, each building being up to around 50 m by 125 m and 15 m high (including top-mounted cooling)"* and up to 60 "Gas engine stacks" of each up to 40 m high. The Scoping Report explains that the envelope would be refined wherever greater certainty about the design of elements of the proposed development is possible.

2.6 As well as the lack of design detail there are uncertainties around the technology to be utilised, including the cooling of the gas engines. The Scoping Report explains that these are provided with air cooling heat exchangers with fans likely to be mounted above each of the engines or on the ground if space permits (3.24) but that the option of 'once through' cooling water as an alternative to air cooling is being considered (3.25).

[1] EIA Scoping Report Thurrock Flexible Generation Plant Land Adjacent to National Grid Substation, Tilbury for Thurrock Power Limited, RPS, July 2018

2.7 The access arrangements are still being considered (3.30 – 3.36) albeit none of these interact with the Tilbury2 proposals.

2.8 The Scoping Report sets out the following construction period for the TFGP:

Q1 2021: main development site preparation and ground works, creation of construction access road and widening of pinch points on public highway, start of gas and (potentially) cooling water pipeline trenching (subject to potential seasonal constraints);

Q2 2021: construction/installation of gas engines, batteries and associated equipment; connection of gas supply pipeline and electricity export cable(s); (potentially) construction and connection of cooling water pipeline;

Q3 2021: commissioning and energisation; completion of landscaping and permanent access road(s);

Q4 2021: facility is available for operation.

2.9 Accordingly, there will be limited, if any, temporal overlap in the anticipated construction programmes of Tilbury2 with TFGP. As set out in the Tilbury2 Environmental Statement (paragraphs 5.126 and 5.127 (AS-006), Tilbury2 would become operational with the opening of the RoRo terminal in Q1 2020. Construction on-site for the remainder of the terrestrial works including the CMAT would continue for another 12 months (i.e. Q1 2021). Assuming construction of TFGP commences at the earliest Q1 2021, all of the main construction activities related to the Tilbury2 proposals (in particular the new lengths of highway and rail line, all maritime infrastructure, and the grading and laying of appropriate pavements across the site) will be complete and the RoRo terminal, and quite possibly the full extent of the CMAT, will be operational.

2.10 PoTLL consider that the time line set out by the applicants for the TFGP is highly optimistic considering no statutory consultation has been undertaken and the level of environmental information provided in the Scoping Report, combined with the need to participate in the competitive Capacity Market auction process. As such, there are unlikely to be cumulative construction environmental effects between Tilbury2 and TFGP due to construction activities being undertaken for both projects at the same time.

2.11 The construction period for TFGP is more likely to overlap with that for TEC should both schemes gain permission and come forward as planned by their respective promotors. As set out in our CEA of the project [REP6-006] it is assumed that construction of TEC project would commence at the earliest in Q2 or Q3 2021; this would therefore be under construction at the same time as TFGP. Mobilisation of construction for LTC could also take place in 2021 (although could slip by one year if private funding is required - SR on LTC, para. 2.1.4). There is therefore a possibility that TFGP, TEC and LTC could be under construction at the same time; but by that time, Tilbury2 will be substantially completed.

3.0 COMMENTARY

Approach to Cumulative Effects Assessment

3.1 The extent of information available within the Scoping Report for TFGP is limited. It is on this basis that PoTLL consider that qualitative and quantitative assessment of cumulative effects of the project with Tilbury2 will necessarily be undertaken by the promoter of the TFGP and that it is inappropriate and indeed not possible for PoTLL to undertake such an assessment at this stage.

3.2 The Scoping Report states that the potential for cumulative impacts with several other nearby major infrastructure projects that are in the process of applying for development consent has been identified and will be assessed in the EIA. These include Tilbury2, the Lower Thames Crossing and the Tilbury Energy Centre. PoTLL consider this to be the correct approach.

3.3 The TFGP promoter will need to develop and design a scheme that is relevant NPS compliant (NPSs EN-1, 2 and 3) and meets legislative and regulatory tests and requirements. The extent to which any cumulative effects arise will depend on both the final design of the project and any mitigation proposed by the promoter both during construction and operation. Indeed, it remains uncertain as to whether or when the proposal will be brought forward at this early stage as it is neither the subject of an application nor has statutory consultation been undertaken.

3.4 Moreover, as was set out in PoTLL Qualitative CEA of LTC and TEC, given the limited knowledge of the design and environmental mitigation which will form part of the TFGP at this stage, it is not the responsibility of the Tilbury2 project to mitigate potential cumulative effects with TFGP and it would not be possible to design such mitigation before the detail of that scheme is known. Requiring any additional mitigation as part of Tilbury2 to pre-empt this future scheme would be unnecessary and unreasonable.

3.5 TFGP, along with both LTC and TEC, require development consent under the Planning Act 2008, and it is undoubtedly EIA development. Accordingly, the environmental impacts of all three of those schemes will fall to be assessed and considered by the relevant decision-makers as and when applications are progressed. All three have identified in their respective Scoping Reports that Tilbury2 is a cumulative project that will be assessed as part of their Environmental Assessment process. By the time these applications are considered through the DCO process, the Tilbury2 DCO may well have been made; if the decision was still to be made, all necessary detail of the Tilbury2 proposals will in any event be available to the promoters of those schemes. This will allow these future proposals to fully take account of the detailed design of Tilbury2, any on-going monitoring, and the associated proposed mitigation. This will ensure that potential cumulative effects will be quantified at the appropriate point and will allow for appropriate design and mitigation strategies (in the following projects) to address cumulative effects if these are indeed identified once the detail of these future proposals is known.

Observations on possible cumulative effects to be considered by TFGP

3.6 The following paragraphs set out the environmental effects that the promotor of TFGP will need to consider on a cumulative basis with Tilbury2, LTC and TEC.

Construction impacts

3.7 From the information available to date (as described above) there will be only limited if any potential overlap in the construction period of Tilbury2 with TFGP.

3.8 The Tilbury2 infrastructure corridor, the laying out of the RoRo Terminal and all marine works will be completed by the end of 2020 when the operation of the RoRo terminal commences, prior to the earliest anticipated construction commencing on TFGP. Whilst construction of the CMAT will continue through 2021 and would potentially overlap with TFGP the extent of engineering works at Tilbury2 will be reducing during this period.

3.9 As such, adding the Tilbury2 construction works during 2021 to the enabling works at TFGP is unlikely to result in significant effects.

Socio-Economics

3.10 The four projects will cumulatively create a sustained period of construction. This could have both positive and adverse effects on socio-economic outcomes, in terms of job creation, skills and training opportunities, and potential stresses on existing infrastructure and community networks. The local demographic profile is expected to be affected by the proposal, particularly if additional employees move to the study area.

Health

3.11 The potential prolonged construction period (even though significant construction at Tilbury2 will be completed prior to commencement at TFGP, LTC or TEC) could have both physical and psychological health impacts on local communities.

3.12 The cumulative impact of all four projects once operational on health would need to be considered further once more detail on aspects such as air quality and noise are known.

Landscape Character and Visual Amenity

3.13 TFGP will create further change in the local landscape with Tilbury2, TEC and LTC, as such the cumulative effect on local landscape character could be of increased significance within the Tilbury Marshes character area. These schemes having been constructed would likely require a reassessment of this character area by Thurrock Council to better reflect what will be increasingly urban/urban fringe characteristics.

3.14 The combined sight and sound of the four projects could have an overall effect of increased significance on scenic quality and tranquillity. The area where this effect would likely be most marked is broadly defined by the rural

extents of the West and East Tilbury Marshes, including the north bank of the Thames as well as the eastern reaches of the Chadwell Escarpment.

3.15 The combined effect of TFGP with Tilbury 2, TEC and LTC could affect cultural heritage value associated with the SAM's of Tilbury Fort, New Tavern Fort and Coalhouse Fort. Being to the east of Tilbury2, the TFGP could increase the presence of industry in the far distance from Coalhouse Fort, adding to TEC and LTC if this were visible and audible in the middle distance (if a link to Tilbury were constructed). The cumulative impacts of all four schemes on leisure and tourism value would need to be considered further once the detail of TFGP is known, albeit it does not appear that any public rights of way are directly affected. In terms of visual amenity, the combined effects of all four projects would be experienced in views from the east and north-east that take in the TEC site and the TFGP (that would be prominent and consolidate the presence of industry at Tilbury2). From the east the effect could be substantial in close views but slight in more distant views such as Coalhouse Fort. From the south (when viewed from Gravesham), the cumulative effects of four schemes could be greater depending on how TFGP is viewed in relation to TEC.

3.16 The cumulative effect of artificial lighting would increase when Tilbury2, TFGP, TEC and LTC schemes are all operational.

Ecology

3.17 In terms of ecology, the Thurrock Flexible Generation Plant (TFGP) proposals have the potential to interact with impacts from the Tilbury2 project mainly by virtue of geographical proximity and the interconnection between certain habitat and species receptors. In particular, the site proposed for the TFGP itself is subject to a draft Local Wildlife Site designation (LoWS) (although this does not appear to have been identified in the scoping report), and is known to support semi-improved coarse grassland and relict grazing marsh habitats of confirmed value for reptiles and (in the boundary ditches) water voles, and with likely value for ground nesting and scrub birds, badgers and species from the nationally significant invertebrate assemblage associated with the power station area generally, potentially including Priority species such as hornet robberfly. Thus, further impacts on such resources could arise from the TFGP with additional consequences for local metapopulations over and above those arising from Tilbury2 alone and/or Tilbury2 cumulatively with the TEC and LTC.

3.18 Less likely to give rise to significant cumulative effects with Tilbury2, but more likely to give rise to such effects in combination with TEC and/or LTC are the ancillary elements of the TFGP project, particularly those involving land east of the power station site and through Goshems Farm area and which appears from the scoping report to have had little survey coverage and certainly less than the main site. Amongst other things the scoping report for TEC identifies the presence of high tide roosts of intertidal birds in this area suggestive of functional linkage to the Thames Estuary and Marshes SPA and Thames Estuary and Marshes Ramsar Site. There is also the suggestion that marine works and works below MHWS will be required in an area known to harbour significant concentrations of intertidal birds with possible additional implications for intertidal habitats functionally

linked to the SPA and Ramsar Site and key species that use them. This is not identified in the scoping report for TFGP but will clearly be a relevant consideration for the assessment of the project when the proponents come to carry out their CEA and in-combination HRA.

Archaeology

3.19 Construction works at TFGP, TEC and LTC could have an adverse effect on the potential buried archaeological and palaeoenvironmental resource which would be in addition to that assessed for Tilbury2. It is anticipated that a suitable strategy for each project would be agreed to avoid, minimise, manage and mitigate against this potential impact.

3.20 Through the successful implementation of the appropriate mitigation measures, it is considered likely that adverse cumulative effects on archaeological resource would be able to be avoided with potentially a beneficial residual effect.

Built Heritage

3.21 The combination of effects on built heritage from Tilbury2, TFGP, TEC and LTC will be greater than any of the individual projects but will to a large degree depend upon the mitigation allied to TFGP, TEC and LTC, for which no information is available.

3.22 The most sensitive asset – Tilbury Fort – and its setting will be affected by all four proposals. Coalhouse Fort, also a Scheduled Monument, could also be more acutely affected by the LTC, TEC & TFGP proposals. The TFGP, allied with the other projects, will need to consider how this is mitigated.

Land-Side Transport

3.23 The TFGP Scoping Report notes (paragraph 8.5.3) that operational traffic would be negligible and is scoped out. Hence in terms of traffic any cumulative effect will only arise due to the construction traffic once Tilbury2 is operational.

3.24 No assessment of the construction traffic is available for TFGP. The lack of detail provided in the TFGP Scoping Report means it is not possible to estimate a broad guide of construction traffic. It is therefore not possible to undertake a cumulative assessment.

3.25 However, it is worth noting that the TFGP Scoping Report states that the route for construction traffic would be via local roads to the north of the site connecting with the A13 at the Orsett Cock junction (paragraph 3.3.1). This is a different local route to that used by Tilbury2 traffic. Accordingly, the cumulative effects would be confined to the A13. It is also worth noting that the construction is predicted to last 12 months.

Hydrogeology and Ground Conditions

3.26 Through the successful implementation of appropriate good practice mitigation measures during the construction and operational phases, there

should not be any significant cumulative effects for the TFGP. LTC, TEC and the Tilbury2 projects in relation to hydrogeology and ground conditions.

Water Resources and Flood Risk

3.27 There are a number of potential combined cumulative effects due to TFGP, TEC and LTC which could impact on the water environment without appropriate design in these schemes and appropriate mitigation measures. This includes increased risk of flooding, increased surface run-off, pollution associated with discharge of process water, spills and leakages during operational periods. Although the magnitude and significance of the effects is currently unknown due to the limited information available on the schemes, it is considered that with the appropriate good practice approach to design and mitigation measures in place the combined effects are unlikely to be significant.

Noise

3.28 It is not anticipated that there will be any significant cumulative effects of TFGP with Tilbury2 during construction. As described above there is likely to be limited overlap between the construction phases of Tilbury2 with those of the TFGP proposal. In operation, the Scoping Report for TFGP indicates that noise generating plant items such as the gas engines, inverters, transformers, air coolers/conditioning units and substations have the potential to result in noise impacts. These will need to be considered cumulatively with the operation of Tilbury2, TEC and LTC.

Air Quality

3.29 It is not anticipated that there will be any significant cumulative effects of TFGP with Tilbury2 during construction. As described above there is likely to be limited overlap between the construction phases of Tilbury2 with those of the TFGP proposal. However, it is necessary to ensure that any dust emissions of all four proposals both individually and in combination are adequately mitigated through project CEMPs, which will be secured by the respective DCOs.

3.30 Once operational, the maximum ground-level concentrations from TFGP stack emissions may overlap with TEC and with the LTC new road network (if a link road to Tilbury is included), which may be used by Tilbury2 land-side transport. If significant effects are identified, then appropriate mitigation would need to be developed such as reconsideration of stack height and/or route alignment. Although the magnitude of the effects is currently unknown due to the limited information available on the schemes, on the basis of the low existing baseline concentrations in the relevant area, the combined residual effects are unlikely to be significant in relation to health protection objectives and limit values.

Waste and Materials

3.31 The waste arisings from all four projects are not known but in combination will be much greater than that assessed for Tilbury2. Each project will need to adhere to the principles of the waste hierarchy and, given the timelines

involved, consider waste capacity at the time those arisings occur. There will be some cumulative impact on waste capacity (since the waste arisings from TFGP, TEC and LTC will follow those from Tilbury2) but the significance of this cannot be determined without knowing the arisings (particularly from LTC which could be significant) or the capacity that would exist at that time. As established by the assessment undertaken by PoTLL for the Tilbury2 project, waste capacity in Thurrock is more limited than in the wider Essex area, and therefore the impacts on this capacity from these future projects could be more significant.

4.0 CONCLUSIONS

4.1 This note provides some initial comments by PoTLL on the potential for cumulative impacts of the Thurrock Flexible Generation Plan (TFGP) which is presently the subject of scoping consultation. It should be considered as an addendum to the Qualitative Cumulative Effects Assessment of Tilbury2 with Tilbury Energy Centre and Lower Thames Crossing (REP6-006).

4.2 In broad terms, a number of environmental effects of the TFGP could interact with Tilbury2 and also with LTC and TEC. If all four were indeed permitted, this interaction could have the potential to increase the level of environmental effect.

4.3 However, the extent of such cumulative effects will depend on both the final designs of the TFGP, TEC and LTC (which will clearly need to be designed to avoid and minimise their environmental effects) and any mitigation proposed by the promoters of those schemes both during construction and operation.

4.4 The TFGP Scoping Report confirms that the EIA process for TFGP will conduct a CEA that will consider all four projects – this is the appropriate approach to be taken to the assessment of cumulative effects arising from this project and Tilbury2.

ANNEX 2

TO THE RESPONSE TO TFGP SCOPING

STATEMENT ON ECOLOGY BY BIOSCAN UK LIMITED

Application by Thurrock Power Ltd (the Applicant) for an Order granting Development Consent for the Thurrock Flexible Generation Plant (the Proposed Development)

Additional comments on the Scoping Report in relation to onshore and intertidal ecology

by Bioscan UK Limited

on behalf of Port of Tilbury London Limited

This statement has been prepared by Bioscan UK Limited on behalf of Port of Tilbury London Limited (PoTLL). Bioscan are PoTLL's consulting ecologists on the Tilbury2 project, the site of which patly adjoins the site of the proposed Thurrock Flexible Generation Plant.

Ecological Designations

The Scoping Report focuses on the main site, and as such the distances cited from the statutory nature conservation designations described at para 2.18 and para 8.85 have been defined in relation to this area only (i.e. Area A), whereas the potential pipeline corridor (Area K) would lie significantly closer (~1km) to these national and internationally designated sites, and appears to encompass intertidal habitats which may have a functional linkage to those designations. This matter has not been discussed in the Scoping Report for TFGP but will clearly be a relevant consideration for the assessment of the project when the proponents carry out their Cumulative Effects Assessment (CEA) and in-combination Habitats Regulations Assessment (HRA).

Furthermore whilst the Lytag Brownfield Local Wildlife Site (LoWS) and Tilbury Centre LoWS have been identified (para 2.19, para 8.86), the presence of the Tilbury Power Station draft LoWS, which forms part of the TFGP 'main development site', appears to have been overlooked by the Applicant. The draft LoWS citation describes the core TFGP footprint as follows:

"Walton Common ... comprises remnant coastal grazing marsh that would formerly have dominated the local landscape. It provides additional foraging habitat for key invertebrates such as the Brown-banded Carder-bee (Bombus humilis) as well as representing additional reptile habitat. ... The surviving fragment of grazing marsh at Walton Common is worthy of conservation in its own right but provides additional foraging habitat for invertebrates and reptiles."

Impacts on this designation should be considered, including impacts on this surviving grazing marsh fragment in the wider landscape-scale context of the Thurrock Thames Marshes. The permanent loss of the draft LoWS and historic grazing marsh will also need to be weighed against the potential operational life of the proposed development being potentially limited to 35 years.

The Applicant has also failed to identify the Tilbury Marshes LoWS within the Scoping Report as falling within the proposed development boundary, and at para 3.38 this land (area J) is identified as having potential 'community use' under a future s106 agreement. Area J encompasses the triangle of grassland adjacent to Fort Road (and within the Tilbury Marshes LoWS) which originally formed part of the Tilbury2 Order Limits, but which was excluded in order to preserve this area of long-established grassland. Consideration will

therefore need to be given to whether potential 'community use' would be compatible with maintaining the ecological interest of this area.

Habitats

The Scoping Report references Extended Phase 1 survey work undertaken in February 2017 as documented at Appendix C. The survey work documented within Appendix C is not consistent with the findings of Tilbury2 ecological reporting, nor is it consistent even with the reporting provided at Appendix D of the Scoping Report; For example Appendix C dismisses Walton Common as 'improved grassland' (and concludes that water voles are unlikely to be present). The reporting also documents survey work which was undertaken by the author of the report on land privately-owned by the Port of Tilbury London Ltd (PoTLL), in the absence of landowner's permission.

An update habitat survey is documented at Appendix D. This describes Walton Common as 'semi-improved grassland' but does not consider whether it meets the definition of Priority coastal and floodplain grazing marsh habitat. Again, it is evident that survey work has been carried out within land under PoTLL ownership (despite landowner permission not having been obtained) for land described as area J. For this area, the habitat descriptions provided by the proponents of TFGP at para 3.32-3.41 can be compared to the detailed information set out within the Tilbury2 ES at Chapter 10[1], with associated Figures[2],[3] and Appendices[4],[5]. The description provided within the TFGP Scoping Report at para 3.32-3.41 and Figure 3.1 characterises the Lytag Brownfield LoWS as species-poor semi-improved grassland with scrub and hard-standing, without any recognition of the presence of Priority open mosaic habitat, or recognition of the interest of the habitat for lichens or invertebrates. Should this failure to recognise and assess the value of the habitats accurately, be carried over to documentation of other areas of the TFGP proposed development site, then the reliability of the other ecological survey information presented within the Scoping Report may be called into question.

Species

It is noted that the desk study documented at Chapter 2 of Appendix D does not include the comprehensive data available for the adjacent landholdings via the Tilbury2 Application and Examination submissions (which are readily accessible via the PINS website). Furthermore, records do not appear to have been sought from the Essex Field Club, which is likely to hold a far greater number of records relevant to the search area than the repositories contacted by TFGP. The evaluation section which follows is therefore considered incomplete.

A notable omission from the list of bird species recorded at Chapter 8 is nightingale (a red list species) which was regularly recorded by the proponents of the Tilbury2 scheme.

Chapter 10 of Appendix D concludes that badger activity is limited and assesses impacts on that basis. However the TFGP proponents should be aware that an artificial sett has now

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000213-6.1%20Environmental%20Statement.pdf
[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000410-6.3%20Figures%20and%20Drawings%20-%20Figure%2010.2b%20Phase%201%20habitat%20survey%20plan%20-%20East%20of%20Fort%20Road.pdf
[3] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000412-6.3%20Figures%20and%20Drawings%20-%20Figure%2010.2d%20Section%2041%20priority%20habitats.pdf
[4] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000240-ES%20Appendix%2010.M%20Lichen%20Survey%20Report%20(2017).pdf
[5] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000239-ES%20Appendix%2010.L%20Invertebrate%20Survey%20of%20Tilbury2%20(2017).pdf

been constructed within the adjacent parcel of land (under planning consent 18/00448/FUL) and the badger assessment provided within the EIA should be updated to reflect this.

Matters Scoped Out

Comments on matters which the Applicant proposes (at Table 7.2 of the Scoping Report) to scope out of EIA are set out below:

- *Bats* – the Tilbury2 ecology surveys identified bat activity within the TFGP main development site. It is therefore considered inappropriate to scope bats out of the EIA process, given that there may be impacts associated with direct loss and illumination of features used by bats for foraging/commuting.
- *Fish impingement* – it is not clear whether the rationale for scoping this out has taken the presence of eels into consideration.
- *Saltmarsh* – in view of the potential construction of cooling water pipe outfalling to the Thames, the Applicant should detail how this would be delivered without any impacts on Priority saltmarsh habitat (such as direct loss/scour) before scoping this matter out.
- *Use of the existing jetty* – it is not clear whether the decision to scope this matter out has taken into consideration the potential for intensification of jetty use to have an impact upon Thames Estuary and Marshes SPA/Ramsar site citation bird species which use intertidal habitats adjacent to the jetty.

Mitigation Proposed

At para 3.37 and Figure 2 of the main scoping report, areas F and G are identified as offering replacement common land and could therefore be subject to heavy grazing. It is unclear how this would be compatible with establishing the reptile mitigation uses for this land as proposed at Chapter 7 of Appendix D, nor with the proposals for scrub planting for birds as described at Chapter 8 of Appendix D.

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Ms Emma Cottam
EIA and Land Rights Advisor
The Planning Inspectorate
Temple Quay House
2 The Square
Bristol, BS1 6PN

Your Ref : NA
Our Ref : 46494

6th September 2018

Dear Ms Cottam

Re: Scoping Consultation
Application for an Order Granting Development Consent for the proposed Thurrock Flexible Generation Plant

Thank you for including Public Health England (PHE) in the scoping consultation phase of the above application. Our response focuses on health protection issues relating to chemicals and radiation. Advice offered by PHE is impartial and independent.

We understand that the promoter will wish to avoid unnecessary duplication and that many issues including air quality, emissions to water, waste, contaminated land etc. will be covered elsewhere in the Environmental Statement (ES). We believe however that the summation of relevant issues into a specific section of the report provides a focus which ensures that public health is given adequate consideration. The section should summarise key information, risk assessments, proposed mitigation measures, conclusions and residual impacts, relating to human health. Compliance with the requirements of National Policy Statements and relevant guidance and standards should also be highlighted.

In terms of the level of detail to be included in an ES, we recognise that the differing nature of projects is such that their impacts will vary. Any assessments undertaken to inform the ES should be proportionate to the potential impacts of the proposal, therefore we accept that, in some circumstances particular assessments may not be relevant to an application, or that an assessment may be adequately completed using a qualitative rather than quantitative methodology. In cases where this decision is made the promoters should fully explain and justify their rationale in the submitted documentation.

The attached appendix outlines generic areas that should be addressed by all promoters when preparing ES for inclusion with an NSIP submission. We are happy to assist and discuss proposals further in the light of this advice.

Yours sincerely,

Environmental Hazards & Emergencies Dept
On behalf of Public Health England
Nsipconsultations@phe.gov.uk

Please mark any correspondence for the attention of National Infrastructure Planning Administration.

Appendix: PHE recommendations regarding the scoping document

General approach

The EIA should give consideration to best practice guidance such as the Government's Good Practice Guide for EIA[1]. It is important that the EIA identifies and assesses the potential public health impacts of the activities at, and emissions from, the installation. Assessment should consider the development, operational, and decommissioning phases.

It is not PHE's role to undertake these assessments on behalf of promoters as this would conflict with PHE's role as an impartial and independent body.

Consideration of alternatives (including alternative sites, choice of process, and the phasing of construction) is widely regarded as good practice. Ideally, EIA should start at the stage of site and process selection, so that the environmental merits of practicable alternatives can be properly considered. Where this is undertaken, the main alternatives considered should be outlined in the ES[2].

The following text covers a range of issues that PHE would expect to be addressed by the promoter. However this list is not exhaustive and the onus is on the promoter to ensure that the relevant public health issues are identified and addressed. PHE's advice and recommendations carry no statutory weight and constitute non-binding guidance.

Receptors

The ES should clearly identify the development's location and the location and distance from the development of off-site human receptors that may be affected by emissions from, or activities at, the development. Off-site human receptors may include people living in residential premises; people working in commercial, and industrial premises and people using transport infrastructure (such as roads and railways), recreational areas, and publicly-accessible land. Consideration should also be given to environmental receptors such as the surrounding land, watercourses, surface and groundwater, and drinking water supplies such as wells, boreholes and water abstraction points.

Impacts arising from construction and decommissioning

Any assessment of impacts arising from emissions due to construction and decommissioning should consider potential impacts on all receptors and describe monitoring and mitigation during these phases. Construction and decommissioning will be associated with vehicle movements and cumulative impacts should be accounted for.

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[1] Environmental Impact Assessment: A guide to good practice and procedures - A consultation paper; 2006; Department for Communities and Local Government. Available from: http://webarchive.nationalarchives.gov.uk/20100410180038/http:/communities.gov.uk/planningandbuilding/planning/sustainabilityenvironmental/environmentalimpactassessment/

[2] DCLG guidance, 1999 http://www.communities.gov.uk/documents/planningandbuilding/pdf/155958.pdf

We would expect the promoter to follow best practice guidance during all phases from construction to decommissioning to ensure appropriate measures are in place to mitigate any potential impact on health from emissions (point source, fugitive and traffic-related). An effective Construction Environmental Management Plan (CEMP) (and Decommissioning Environmental Management Plan (DEMP)) will help provide reassurance that activities are well managed. The promoter should ensure that there are robust mechanisms in place to respond to any complaints of traffic-related pollution, during construction, operation, and decommissioning of the facility.

Emissions to air and water

Significant impacts are unlikely to arise from installations which employ Best Available Techniques (BAT) and which meet regulatory requirements concerning emission limits and design parameters. However, PHE has a number of comments regarding emissions in order that the EIA provides a comprehensive assessment of potential impacts.

When considering a baseline (of existing environmental quality) and in the assessment and future monitoring of impacts these:

- should include appropriate screening assessments and detailed dispersion modelling where this is screened as necessary
- should encompass all pollutants which may be emitted by the installation in combination with all pollutants arising from associated development and transport, ideally these should be considered in a single holistic assessment
- should consider the construction, operational, and decommissioning phases
- should consider the typical operational emissions and emissions from start-up, shut-down, abnormal operation and accidents when assessing potential impacts and include an assessment of worst-case impacts
- should fully account for fugitive emissions
- should include appropriate estimates of background levels
- should identify cumulative and incremental impacts (i.e. assess cumulative impacts from multiple sources), including those arising from associated development, other existing and proposed development in the local area, and new vehicle movements associated with the proposed development; associated transport emissions should include consideration of non-road impacts (i.e. rail, sea, and air)
- should include consideration of local authority, Environment Agency, Defra national network, and any other local site-specific sources of monitoring data
- should compare predicted environmental concentrations to the applicable standard or guideline value for the affected medium (such as UK Air Quality Standards and Objectives and Environmental Assessment Levels)
    - If no standard or guideline value exists, the predicted exposure to humans should be estimated and compared to an appropriate health-based value (a Tolerable Daily Intake or equivalent). Further guidance is provided in Annex 1
    - This should consider all applicable routes of exposure e.g. include consideration of aspects such as the deposition of chemicals emitted to air and their uptake via ingestion
- should identify and consider impacts on residential areas and sensitive receptors (such as schools, nursing homes and healthcare facilities) in the area(s) which

may be affected by emissions, this should include consideration of any new receptors arising from future development

Whilst screening of impacts using qualitative methodologies is common practice (e.g. for impacts arising from fugitive emissions such as dust), where it is possible to undertake a quantitative assessment of impacts then this should be undertaken. PHE's view is that the EIA should appraise and describe the measures that will be used to control both point source and fugitive emissions and demonstrate that standards, guideline values or health-based values will not be exceeded due to emissions from the installation, as described above. This should include consideration of any emitted pollutants for which there are no set emission limits. When assessing the potential impact of a proposed installation on environmental quality, predicted environmental concentrations should be compared to the permitted concentrations in the affected media; this should include both standards for short and long-term exposure.

Additional points specific to emissions to air
When considering a baseline (of existing air quality) and in the assessment and future monitoring of impacts these:

- should include consideration of impacts on existing areas of poor air quality e.g. existing or proposed local authority Air Quality Management Areas (AQMAs)
- should include modelling using appropriate meteorological data (i.e. come from the nearest suitable meteorological station and include a range of years and worst case conditions)
- should include modelling taking into account local topography

Additional points specific to emissions to water
When considering a baseline (of existing water quality) and in the assessment and future monitoring of impacts these:

- should include assessment of potential impacts on human health and not focus solely on ecological impacts
- should identify and consider all routes by which emissions may lead to population exposure (e.g. surface watercourses; recreational waters; sewers; geological routes etc.)
- should assess the potential off-site effects of emissions to groundwater (e.g. on aquifers used for drinking water) and surface water (used for drinking water abstraction) in terms of the potential for population exposure
- should include consideration of potential impacts on recreational users (e.g. from fishing, canoeing etc.) alongside assessment of potential exposure via drinking water

Land quality
We would expect the promoter to provide details of any hazardous contamination present on site (including ground gas) as part of the site condition report. Emissions to and from the ground should be considered in terms of the previous history of the site and the potential of the site, once operational, to give rise to issues. Public health impacts associated with ground contamination and/or the

migration of material off-site should be assessed[3] and the potential impact on nearby receptors and control and mitigation measures should be outlined.
Relevant areas outlined in the Government's Good Practice Guide for EIA include:

- effects associated with ground contamination that may already exist
- effects associated with the potential for polluting substances that are used (during construction / operation) to cause new ground contamination issues on a site, for example introducing / changing the source of contamination
- impacts associated with re-use of soils and waste soils, for example, re-use of site-sourced materials on-site or offsite, disposal of site-sourced materials offsite, importation of materials to the site, etc.

Waste

The EIA should demonstrate compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery and disposal).
For wastes arising from the installation the EIA should consider:

- the implications and wider environmental and public health impacts of different waste disposal options
- disposal route(s) and transport method(s) and how potential impacts on public health will be mitigated

Other aspects

Within the EIA PHE would expect to see information about how the promoter would respond to accidents with potential off-site emissions e.g. flooding or fires, spills, leaks or releases off-site. Assessment of accidents should: identify all potential hazards in relation to construction, operation and decommissioning; include an assessment of the risks posed; and identify risk management measures and contingency actions that will be employed in the event of an accident in order to mitigate off-site effects.

The EIA should include consideration of the COMAH Regulations (Control of Major Accident Hazards) and the Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009: both in terms of their applicability to the installation itself, and the installation's potential to impact on, or be impacted by, any nearby installations themselves subject to the these Regulations.

There is evidence that, in some cases, perception of risk may have a greater impact on health than the hazard itself. A 2009 report[4], jointly published by Liverpool John Moores University and the HPA, examined health risk perception and environmental problems using a number of case studies. As a point to consider, the report suggested: "Estimation of community anxiety and stress should be included as part of every risk or impact assessment of proposed plans that involve a potential environmental hazard. This is true even when the physical health risks may be

[3] Following the approach outlined in the section above dealing with emissions to air and water i.e. comparing predicted environmental concentrations to the applicable standard or guideline value for the affected medium (such as Soil Guideline Values)

[4] Available from: http://www.cph.org.uk/wp-content/uploads/2012/08/health-risk-perception-and-environmental-problems--summary-report.pdf

negligible.” PHE supports the inclusion of this information within EIAs as good practice.

Electromagnetic fields (EMF)

This statement is intended to support planning proposals involving electrical installations such as substations and connecting underground cables or overhead lines. PHE advice on the health effects of power frequency electric and magnetic fields is available in the following link:

https://www.gov.uk/government/collections/electromagnetic-fields#low-frequency-electric-and-magnetic-fields

There is a potential health impact associated with the electric and magnetic fields around substations, and power lines and cables. The field strength tends to reduce with distance from such equipment.

The following information provides a framework for considering the health impact associated with the electric and magnetic fields produced by the proposed development, including the direct and indirect effects of the electric and magnetic fields as indicated above.

Policy Measures for the Electricity Industry

The Department of Energy and Climate Change has published a voluntary code of practice which sets out key principles for complying with the ICNIRP guidelines:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/37447/1256-code-practice-emf-public-exp-guidelines.pdf

Companion codes of practice dealing with optimum phasing of high voltage power lines and aspects of the guidelines that relate to indirect effects are also available:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48309/1255-code-practice-optimum-phasing-power-lines.pdf

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224766/powerlines_vcop_microshocks.pdf

Exposure Guidelines

PHE recommends the adoption in the UK of the EMF exposure guidelines published by the International Commission on Non-ionizing Radiation Protection (ICNIRP). Formal advice to this effect was published by one of PHE’s predecessor organisations (NRPB) in 2004 based on an accompanying comprehensive review of the scientific evidence:-

http://webarchive.nationalarchives.gov.uk/20140629102627/http://www.hpa.org.uk/Publications/Radiation/NPRBArchive/DocumentsOfTheNRPB/Absd1502/

Updates to the ICNIRP guidelines for static fields have been issued in 2009 and for low frequency fields in 2010. However, Government policy is that the ICNIRP guidelines are implemented in line with the terms of the 1999 EU Council Recommendation on limiting exposure of the general public (1999/519/EC):

http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Publichealth/Healthprotection/DH_4089500

Static magnetic fields

For static magnetic fields, the ICNIRP guidelines published in 2009 recommend that acute exposure of the general public should not exceed 400 mT (millitesla), for any part of the body, although the previously recommended value of 40 mT is the value used in the Council Recommendation. However, because of potential indirect adverse effects, ICNIRP recognises that practical policies need to be implemented to prevent inadvertent harmful exposure of people with implanted electronic medical devices and implants containing ferromagnetic materials, and injuries due to flying ferromagnetic objects, and these considerations can lead to much lower restrictions, such as 0.5 mT.

Power frequency electric and magnetic fields

At 50 Hz, the known direct effects include those of induced currents in the body on the central nervous system (CNS) and indirect effects include the risk of painful spark discharge on contact with metal objects exposed to the field. The ICNIRP guidelines published in 1998 give reference levels for public exposure to 50 Hz electric and magnetic fields, and these are respectively 5 kV m^{-1} (kilovolts per metre) and 100 μT (microtesla). The reference level for magnetic fields changes to 200 μT in the revised (ICNIRP 2010) guidelines because of new basic restrictions based on induced electric fields inside the body, rather than induced current density. If people are not exposed to field strengths above these levels, direct effects on the CNS should be avoided and indirect effects such as the risk of painful spark discharge will be small. The reference levels are not in themselves limits but provide guidance for assessing compliance with the basic restrictions and reducing the risk of indirect effects.

Long term effects

There is concern about the possible effects of long-term exposure to electromagnetic fields, including possible carcinogenic effects at levels much lower than those given in the ICNIRP guidelines. In the NRPB advice issued in 2004, it was concluded that the studies that suggest health effects, including those concerning childhood leukaemia, could not be used to derive quantitative guidance on restricting exposure. However, the results of these studies represented uncertainty in the underlying evidence base, and taken together with people's concerns, provided a basis for providing an additional recommendation for Government to consider the need for

further precautionary measures, particularly with respect to the exposure of children to power frequency magnetic fields.

The Stakeholder Advisory Group on ELF EMFs (SAGE)

SAGE was set up to explore the implications for a precautionary approach to extremely low frequency electric and magnetic fields (ELF EMFs), and to make practical recommendations to Government:

http://www.emfs.info/policy/sage/

SAGE issued its First Interim Assessment in 2007, making several recommendations concerning high voltage power lines. Government supported the implantation of low cost options such as optimal phasing to reduce exposure; however it did not support not support the option of creating corridors around power lines on health grounds, which was considered to be a disproportionate measure given the evidence base on the potential long term health risks arising from exposure. The Government response to SAGE's First Interim Assessment is available here:

http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107124

The Government also supported calls for providing more information on power frequency electric and magnetic fields, which is available on the PHE web pages (see first link above).

Annex 1

Human health risk assessment (chemical pollutants)

The points below are cross-cutting and should be considered when undertaking a human health risk assessment:

- The promoter should consider including Chemical Abstract Service (CAS) numbers alongside chemical names, where referenced in the ES
- Where available, the most recent United Kingdom standards for the appropriate media (e.g. air, water, and/or soil) and health-based guideline values should be used when quantifying the risk to human health from chemical pollutants. Where UK standards or guideline values are not available, those recommended by the European Union or World Health Organisation can be used
- When assessing the human health risk of a chemical emitted from a facility or operation, the background exposure to the chemical from other sources should be taken into account
- When quantitatively assessing the health risk of genotoxic and carcinogenic chemical pollutants PHE does not favour the use of mathematical models to extrapolate from high dose levels used in animal carcinogenicity studies to well below the observed region of a dose-response relationship. When only animal data are available, we recommend that the 'Margin of Exposure' (MOE) approach[5] is used

[5] Benford D et al. 2010. Application of the margin of exposure approach to substances in food that are genotoxic and carcinogenic. Food Chem Toxicol 48 Suppl 1: S2-24

Thurrock Flexible Generation Plant – proposed development by Thurrock Power Ltd

Royal Mail Group Limited comments on information to be provided in applicant's Environmental Statement

Introduction

Reference the letter from PINS to Royal Mail dated 10 August 2018 requesting Royal Mail's comments on the information that should be provided in Thurrock Power Ltd's Environmental Statement.

Royal Mail's consultants BNP Paribas Real Estate have reviewed the applicant's Scoping Report dated August 2018, scrutinising the proposed development and its potential impacts.

Royal Mail– relevant information

Under section 35 of the Postal Services Act 2011 (the "Act"), Royal Mail has been designated by Ofcom (the independent communications regulator) as a provider of the Universal Postal Service.

Royal Mail is the only such provider in the United Kingdom. Its services are regulated by the Communications Industry Regulator, Ofcom.

In respect of its postal services functions, section 29 of the Act provides that Ofcom's primary regulatory duty is to secure the provision of the Universal Postal Service. Ofcom discharges this duty by imposing regulatory conditions on Royal Mail, requiring it to provide the Universal Postal Service.

By sections 30 and 31 of the Act (read with sections 32 and 33) there is a set of minimum standards for Universal Service Providers, which Ofcom must secure. The conditions imposed by Ofcom reflect those standards. There is, in effect, a statutory obligation on Royal Mail to provide at least one collection from letterboxes and post offices six days a week and one delivery of letters to all 29 million homes and businesses in the UK six days a week (five days a week for parcels). Royal Mail must also provide a range of "end to end" services meeting users' needs, e.g. First Class, Second Class, Special Delivery by 1 pm, International and Redirections services.

Royal Mail is under some of the highest specification performance obligations for quality of service in Europe. Its performance of the Universal Service Provider obligations is in the public interest and should not be affected detrimentally by any statutorily authorised project.

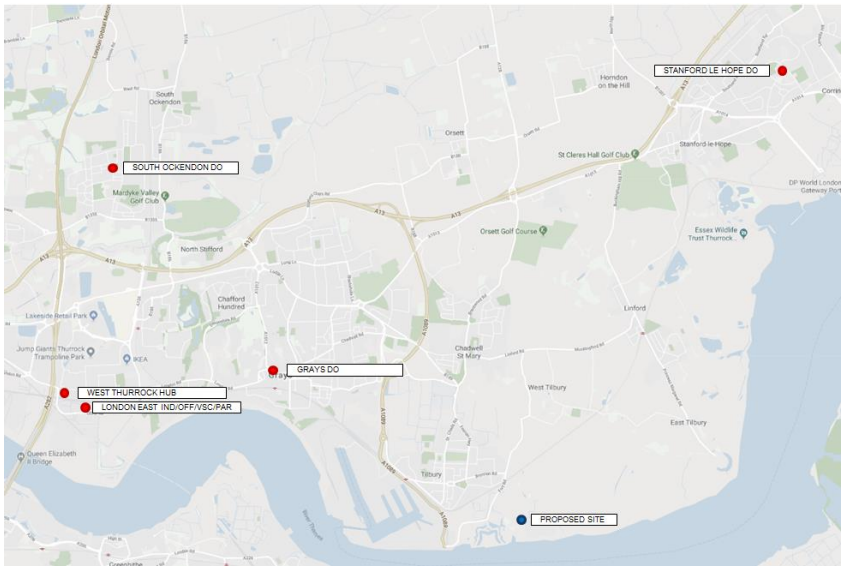
Royal Mail's postal sorting and delivery operations rely heavily on road communications. Royal Mail's ability to provide efficient mail collection, sorting and delivery to the public is sensitive to changes in the capacity of the highway network.

Royal Mail is a major road user nationally. Disruption to the highway network and traffic delays can have direct consequences on Royal Mail's operations, its ability to meet the Universal Service Obligation and comply with the regulatory regime for postal services thereby presenting a significant risk to Royal Mail's business.

Potential impacts of the scheme on Royal Mail

Royal Mail has five operational properties within 8 miles of the proposal site as identified on the schedule and plan below.

GRAYS Delivery Office	HOGG LANE RM17 5QB	4.3 miles
LONDON EAST Offices / Vehicle Service Centre / Parking	OLIVER ROAD RM20 3ED	6.9 miles
WEST THURROCK Mail HUB	UNIT 6B TRADE LINK WESTON AVE RM20 3FJ	7.1 miles
STANFORD LE HOPE Delivery Office	30 ST JOHNS WAY SS17 7LH	7.7 miles
SOUTH OCKENDON Delivery Office	DERRY AVENUE RM15 5DU	7.8 miles



It is relevant to note that Royal Mail is currently preparing to submit a planning application to intensify the existing use of its Oliver Road site in Thurrock, as identified above. The site is increasing in its operational importance to Royal Mail.

The location, nature and scale of the proposed Thurrock Flexible Generation Plant may present risk of construction phase impact / delays to Royal Mail's road based operations on the surrounding road network.

Every day, in exercising its statutory duties Royal Mail vehicles use all of the main roads that may potentially be affected by additional traffic arising from the construction of this proposed Peaking Plant.

Royal Mail therefore wishes to ensure the protection of its future ability to provide an efficient mail sorting and delivery service to the public in accordance with its statutory obligations which may be adversely affected by the construction and operation of this proposed scheme.

Royal Mail's comments on information that should be provided in Thurrock Power Ltd's Environmental Statement

Royal Mail has the following comments / requests:

1. Royal Mail requests that the ES includes information on the needs of major road users (such as Royal Mail) and acknowledges the requirement to ensure that major road users are not disrupted though full consultation at the appropriate time in the DCO and development process.

2. The ES should include detailed information on the construction traffic mitigation measures that are proposed to be implemented, including a draft Construction Traffic Management Plan (CTMP).

3. Royal Mail requests that careful attention is given to the potential for cumulative traffic impact during the construction phase. The Scoping Report should address the potential cumulative traffic effects arising from the construction of Thurrock Flexible Generating Plant together with all other proposed major developments in the area, including the Lower Thames Crossing, the Tilbury2 Port expansion and the proposed thermal generation scheme at Tilbury Power Station.

4. Royal Mail requests that it is fully pre-consulted by Thurrock Power Ltd on any proposed road closures / diversions/ alternative access arrangements, hours of working and the content of the CTMP. The ES should acknowledge the need for this consultation with Royal Mail and other relevant local businesses / occupiers.

Royal Mail is able to supply the applicant with information on its road usage / trips if required.

Should PINS or Thurrock Power Ltd have any queries in relation to the above then in the first instance please contact Holly Trotman *(holly.trotman@royalmail.com)* of Royal Mail's Legal Services Team or Daniel Parry-Jones *(daniel.parry-jones@bnpparibas.com)* of BNP Paribas Real Estate.

Civic Offices, New Road, Grays
Essex, RM17 6SL

Development Management

Applicant: Emma Cottam
The Planning Inspectorate, Temple Quay House, 2 The Square,
Bristol, BS1 6PN

Our Ref: 18/4044/SCO

E-Mail: dm@thurrock.gov.uk

Date: 7 September 2018

Dear Ms Cottam

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11

Application by Thurrock Power Ltd (the Applicant) for an Order granting Development Consent for the Thurrock Flexible Generation Plant (the Proposed Development)

Scoping consultation – LPA Response

Your Reference:	**EN010092-000018**
Our Reference:	**18/4044/SCO**
Proposal:	**Planning Inspectorate Consultation - Scoping Report for future Development Consent Order [NSIP] - Proposal: To develop a flexible generation plant using fast start gas engines on land north of Tilbury substation to provide up to 600 MW of electrical generation capacity together with up to 150 MW of battery storage capacity and associated infrastructure**
Location:	**Thurrock Flexible Generation Plant Fort Road Tilbury**

I refer to your letter dated 10 August 2018 regarding the above matter and to your request that the local planning authority (LPA):

- inform the Planning Inspectorate of the information we consider should be provided in the ES; or
- confirm that we do not have any comments.

By way of background information I can confirm that representatives of the applicant have met with Council officers to explain the proposed Thurrock Flexible Generation Plant project and to discuss timelines for the project.

In response to both your letter dated 10 August 2018 and the accompanying EIA Scoping Report the LPA consulted internally within Thurrock Council and I attach responses received from:

- Thurrock Council: Emergency Planner;
- Thurrock Council: Environmental Health;
- Thurrock Council: Highways;
- Thurrock Council: Landscape and Ecology Advisor;
- Thurrock Council: Public Health; and

Scope of the Proposed Environmental Statement

The general purpose of the Scoping Report is to determine, from all the project's likely effects, those that are predominantly significant with respect to impacts on the environment. The contents of the Scoping Report are generally endorsed by the LPA, subject to the comments contained in this letter and of those comments made by the consultees.

The ES must include the information reasonably required to assess the environmental effects of the development and to which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile. The proposed structure of the ES is set out at chapter 6 of the Scoping Report. I consider that this generally accords with the provisions of the Regulations.

Chapter 7 of the Scoping Report provide a list of those environmental topic areas which are "scoped-in" to the ES as follows:

- Landscape and visual resources;
- Archaeology and cultural heritage including marine archaeology where applicable;
- Traffic and transport;
- Land use, agriculture and socio-economics;
- Air quality;
- Onshore ecology;
- Aquatic environment;
- Habitat Regulations Assessment report;
- Noise and vibration;
- Water resources and flood risk, including WFD impacts;
- Geology, hydrogeology and land contamination; and
- Climate change.

I am satisfied that this list of topics will enable a thorough assessment of the likely significant environmental impacts of the proposals but I also request that the comments from the Thurrock Council consultation process enclosed with this response are taken into consideration in the preparation of the Environmental Statements as part of this Council's response to this Scoping application.

I note that paragraph 6.58 of the Scoping Report refer to cumulative impacts and the in-combination impacts with reasonably foreseeable projects in the vicinity of the site, which includes:

- The Tilbury 2 project – current DCO;
- The Lower Thames Crossing – future DCO;
- The Tilbury Green Power Station – currently operational;
- Demolition of Tilbury B Power Station – currently ongoing;
- The Tilbury Energy Centre [Replacement Tilbury Power Station] – future DCO;
- London Distribution Park in Tilbury;
- Thames Enterprise Park in Coryton; and
- Goshen Farm – land raising operation of land used for ash disposal and landfill.

Another future DCO not on the list but should be subject of consideration for cumulative effects is the 'The London Resort' project.

Summary

I trust that the above comments and enclosures are of assistance. The above information is given without prejudice to the LPA's future comments or position in relation to a formal submission pursuant to the 2008 Act.

Yours sincerely



Chris Purvis
Principal Planning Officer (Major Applications)

Civic Offices, New Road, Grays
Essex RM17 6SL

Public Protection

Chris Purvis
Principal Planning Officer
Planning and Development Control
Civic Offices
New Road
Grays
RM17 6SL

29th August 2018

Dear Chris,

Town and Country Planning Act 1990 (as amended)
Application Number: 18/4044/SCO. Thurrock Flexible Generation Plant Fort Road Tilbury Essex.
Proposal: Scoping Report for future Development Consent Order [NSIP] - Proposal: To develop a flexible generation plant using fast start gas engines on land north of Tilbury substation to provide up to 600 MW of electrical generation capacity together with up to 150 MW of battery storage capacity and associated infrastructure | Thurrock Flexible Generation Plant Fort Road Tilbury Essex

Thank you for consulting Thurrock Council Emergency Planning Team on the above application.

We acknowledge the EIA Scoping Report submitted dated July 2018 by RPS Group.

From emergency planning perceptive, two main areas of interest to us in this development were:

- Flood Risk- **Section 8.143-8.162** of the scoping report proposed to consider the effects of flood risk during the construction, operation and decommission phase which will be outlined in the Flood Risk Assessment (FRA).

- Emergency Management Response Plan- **Section 9.5** of the scoping report will considered the off-site impacts.

We conclude that the scoping report document have covered these two areas.

If you have any further question, please email emergency.planning@thurrock.gov.uk
Yours faithfully

Adewale Adesina
Emergency Planning Officer
emergency.planning@thurrock.gov.uk

INVESTORS IN PEOPLE | Gold

INTERDEPARTMENTAL MEMORANDUM

From: Environmental Protection Team	To: Planning, Transportation & Public Protection Department Place Directorate
TEL: 01375 652096	FAO Chris Purvis
MY REF: CDP 18/21059/PLACON	
DATE: 24/08/2018	YOUR REF 18/4044/SCO

SUBJECT Planning Inspectorate Consultation - Scoping Report for future Development Consent Order [NSIP] - Proposal: To develop a flexible generation plant using fast start gas engines on land north of Tilbury substation to provide up to 600 MW of electrical generation capacity together with up to 150 MW of battery storage capacity and associated infrastructure

We will limit our comments to those aspects of the scoping document relevant to the Environmental Protection Team namely air quality, noise and vibration and contaminated land

Air quality

We are satisfied with the proposed methodology outlined in the Air quality section of the document and the proposal to scope out the operational traffic air pollutant emissions.

Noise

We are satisfied with the proposed methodology outlined in the noise and vibration section of the document and have no objections to the operational traffic noise and operational vibration being scoped out of the assessment.

Contaminated land

We are satisfied with the proposed methodology outlined in the geology hydrogeology and land contamination section of the document.

Section 3.42 of the document advises that the ES will be accompanied by a code of construction practice (CoCP) and an outline construction environmental management plan (CEMP) any such plans should be agreed with the local authority.

[redacted]

Thurrock Borough Council
Environmental Health Officer
Environmental Protection Team

Highways Response

To:-	**Development Management**
From:	**Highways Development Control**
This matter is being dealt with by:	Julian Howes
Date:	31st August 2018
Application No.	18/4044/SCO
Address:	Thurrock Flexible Generation Plant, Fort Road, Tilbury, Essex,
Proposal:	Planning Inspectorate Consultation - Scoping Report for future Development Consent Order [NSIP] - Proposal: To develop a flexible generation plant using fast start gas engines on land north of Tilbury substation to provide up to 600 MW of electrical generation capacity together with up to 150 MW of battery storage capacity and associated infrastructure

RECOMMENDATION: Further information required

It is noted that the Traffic and Transport chapter of the Environmental Impact Assessment Scoping Report mentions a Transport Assessment, and that a Transport Assessment Scoping Report is to be produced and agreed with Thurrock Council and Highways England. They have also indicated that the most significant impact would be during the construction phase of the development but the document will also need to clarify the operational traffic levels once the development is in operation to ensure that the operational traffic will not have a significant impact on the highway network. The current document is insufficient to make any detailed comments at this stage on their assumptions. Can you advise the applicant that they need to submit the appropriate detailed documents to enable further and more detailed comments to be made. Please note that Highways England will also need to be consulted as this development is likely to impact on their network.

A framework TA should be submitted and agreed with the Highway Authority and Highways England, prior to submission of any ensuing planning application.

With regards to the scope of the TA, assessment of the following roads and junction should be made, in line with DMRB assessment criteria:

i. M25 / A13 - junctions 30 and 31

ii. Tilbury Junction of the A13

iii. A1089 / St. Andrews Road junction (ASDA Roundabout)

iv. Ferry Road and Fort Road

v. A126/Old Dock Approach Road roundabout and slip roads.

vi. The other roads detailed in the Traffic and Transport chapter.

A distribution of traffic is required, particularly at the Tilbury junction of the A13, to determine whether assessment of the A128 Orsett Cock Interchange and the A1014 Stanford Interchange of the A13 are required.

Regards: Julian Howes
Date: 31 August 2018

Thurrock Flexible Generation Plant Fort Road Tilbury Essex – 18/4044/SCO

Planning Inspectorate Consultation - Scoping Report for future Development Consent Order [NSIP] - Proposal: To develop a flexible generation plant using fast start gas engines on land north of Tilbury substation to provide up to 600 MW of electrical generation capacity together with up to 150 MW of battery storage capacity and associated infrastructure

It is understood that the final design has yet to be determined and this will have some effects on the areas of land that will be used and the overall number and height of the structures that will be required. The current layout therefore is considered to be a 'worse-case' in terms of effects.

Landscape and visual

The proposed Landscape and Visual Impact Assessment will be carried out in accordance with the best practice guidance e.g. the Guidelines for Landscape and Visual Impact Assessment 3rd Edition. During an initial meeting potential viewpoints were discuss. It is agreed that these will be finalised with the local authorities prior to commencement of the LVIA.

At present the route to be used for construction traffic has yet to be finalised. There is concern that the option running south and east of Chadwell St Mary using Turnpike Lane is likely to have significant adverse impacts on the characters of historic lanes the adjacent Conservation Area. It is hoped that an alternative route can be identified.

Ecology

The ecology methodology is considered to meet good practice guidance.

The assessment recognises the need to carry out an Appropriate Assessment of the potential effects on the Thames Estuary and Marshes SPA. Consideration will need to be given to potential cumulative impacts arising from other developments within this area.

The Council has undertaken a Local Wildlife Site review which will be adopted shortly. The revised boundary of the Tilbury Power Station and Goshems Farm LWS is attached for information. The Tilbury 2 scheme used this boundary for their assessment.

The land north of the railway identified as exchange land for the loss of Walton's Common has the potential to provide important biodiversity mitigation with scope to incorporate additional invertebrate habitat features. It is hoped that there will be dialogue between representatives of the adjoining proposed developments to see if there can be improved linkages between the various onsite mitigation schemes to maximise their connectivity.

Regards

Steve Plumb

Civic Offices, New Road, Grays
Essex RM17 6SL

Chris Purvis
Planning and Growth Team
Thurrock Council Offices
New Road
Grays
Essex RM17 6SL
Monday 3rd September2018

Dear Chris,

RE - 18/4044/SCO – EIA Scoping Opinion consultation for the development of Thurrock Flexible Generation Plant, Tilbury, Essex

Thank for you consulting Thurrock Council's Public Health Team on the above EIA scoping consultation application.

With regards to this EIA scoping report and any subsequent planning application that will be informed by this consultation, it is felt important that consideration is paid to the potential human health impacts in respect of this proposed development. This relates to the health and wellbeing of any person(s) employed both during construction and operational stages, local residents living in communities within close proximity to the proposed development and the wider community as a whole where impacts may be felt.

It is felt to be a useful starting point, to provide a definition of what is meant by the term 'human health' to support and enable full consideration of the potential health impacts that may arise from this proposed development . This will ensure that the appropriate and adequate mitigation processes can be developed and implemented to reduce such impacts on health.

The World Health Organisation (WHO) defines health as "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmary." This definition encapsulates the 'holistic' and 'whole' person. Health and wellbeing can be affected by a variety of complex and interrelated factors including the built environment and communities that people live in. The definition also focusses on keeping people well. In order to support people to remain well requires acknowledgement of the role that wider determinants of health can play. This includes consideration of issues such as landscape, traffic, congestion, air quality, and how economic factors such as employment can impact on health.

Based on this understanding of health and the information provided in the EIA scoping report document there were a number of areas identified that require further investigation, clarification and inclusion within the EIA and any subsequent planning applications. Although some of these issues have been touched upon within the EIA scoping report, these more broadly relate to how they impact on the environment. It is felt that clearer links to the potential human health impacts need to be included in the scoping of the EIA and later planning application.

The impacts are considered based on their magnitude, duration and reversibility.

Civic Offices, New Road, Grays
Essex RM17 6SL

Air quality and traffic & congestion

Operational transport from staff on the site is estimated to be minimal but we recommend that suitable cycle and walking routes are developed within the site and also on the approach road networks to the site conterminously with other users of these networks. Tilbury station and Tilbury ferry are both within easy reachable distance both by foot and cycle to the proposed site. Use of these modes of travel would encourage physical activity amongst staff groups and reduce road congestion and the potential for a negative impact on air quality. We welcome the inclusion of the idea of individual travel plans which should be encouraged amongst staff.

The report states that over 30 two-way traffic movements an hour as a traffic assessment would be required. This should be modelled on the cumulative effect of the existing vehicle movements and further potential movements of vehicles that might occur for other development in the near vicinity. There is also a concern that the use of the identified road/track during this period of development may result in delays and tailbacks that may result in an increase in emissions which could have a detrimental effect on air quality. Can you further identify how you will reduce the likelihood of emissions? E.g. low carbon vehicles, regulated movements, use of the Thames as a method of delivery etc. during the construction phase as part of the traffic assessment for traffic.

It is highlighted in the document that the developer is aware that there is an AQMA located in Tilbury along Dock Road, Calcutta Road and St Chad's Road. The report states that the development will be designed to meet and, where feasible, better the emissions limits required by its Environmental Permit, and that impacts from both the construction and operational phase will be assessed, including undertaking of a dust impact assessment. These will need to be modelled to understand the potential cumulative effects from other developments in the local area, both current and in the future.

The identification within the LVIA for the use of greening and landscaping with strategic planting will not only support mitigation on air quality, but would look to mitigate the impacts on climate change (which will include issues arising from flooding and managing extremes in weather temperature) and will also benefit local residents and employees in terms of the mental well-being benefits that a green visual landscape would bring. Light pollution will also need to be identified within this, as this could have an effect on well-being through sleep deprivation.

Noise pollution

It is stated that there is the possibility of piling and dredging noise which may affect the population of Tilbury during construction. A cumulative assessment of current noise levels and modelled noise levels from this and other new and emerging development should be undertaken and used as part of the noise impact assessment. Public Health would like to see the noise impact assessment and strategies to alleviate this, as ongoing noise at a significant level can have a detrimental impact on mental health. The high health needs of the Tilbury population could lead to exacerbation to existing conditions such as circulatory disease etc.

Water safety

Public Health would be interested in the strategies that are developed to ensure that there are no potentially unacceptable pollutant leakages that may cause risk to human health and suggest that this is included as part of the HIA.

Civic Offices, New Road, Grays
Essex RM17 6SL

Other

The Government believes that from fuel efficiency and climate change perspective waste heat from large power stations should be utilised where possible for community heating and industrial uses." Is it the intention to utilise waste heat to local communities? In Thurrock as a whole 7.4% of the population live in fuel poverty. This equates to 12,215 people across the borough. Tilbury is one of the areas of highest deprivation within the borough so a proportion of people living in fuel poverty are likely to lie within Tilbury. Community heating utilised by waste heat would therefore benefit many local residents and reduce health inequalities that exist in Thurrock. In addition, we would like to request that further information be provided in relation to the interactions between the proposed developments of the Tilbury Energy Centre and the Port of Tilbury (Tilbury 2) and how this may impact on the ability of the proposed development to adequately supply energy to local residents. We are interested in these as it relates to the point outlined above about issues of fuel poverty in the surrounding area.

Whilst we understand that the gas pipe lines will require further permission, once decided upon, we would like this to be captured within the HIA as requiring further response especially as they are classed as a Major Accident Hazard which could lead to risks to human health. We are also concerned about the impact on access to green open space and rights of way.

We would encourage working to explore/secure employment investment from the local population and suggest that TPL provide a skills mix to help identify and develop new skills requirements working with Thurrock Council to develop a skills action plan. This will then allow local colleges and employment agencies to allow them to understand the skills required to enable employment opportunities within local communities. This is positive as employment is related to benefits in relation to health and wellbeing. It will be important to include this within any planning application that follows.

We are pleased that that consideration is being given to the possible future installation of carbon capture storage technology and understand that if this occurs a further planning application would be made around this in the future. We would like this to be captured within the HIA as requiring further response.

We note that the EIA Scoping Report states that a HIA chapter will be undertaken. Although the brief information included appears to contain all of the health determinants we would expect to be included in a HIA we would request that due to the 'likely significant impacts' and the cumulative effects of this and other significant infrastructure to be developed in close proximity to this site that a standalone Health Impact Assessment (HIA) chapter will provide a comprehensive and detailed account of all potential impacts, their likelihood and significance in terms of impact on human health and welcome your confirmation on this. As part of the HIA consideration of the cumulative impacts as this and other developments will be needed to ensure that health impacts are accurately measured and mitigation is sufficient and appropriate.

A HIA chapter would include ward(s) level health profiles of the local area/communities whose health may be impacted by the development. This ward level information is available from Public Health England's "Local Health" website which is available at: http://www.localhealth.org.uk/#l=en;v=map13. Further borough level information is available at Public Health England's Health Profile tool, 'Fingertips' which is available at: https://fingertips.phe.org.uk/. A health profile would enable consideration to be paid to the possible health impacts of the specific population living within Tilbury, and mitigation could be embedded

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that would help reduce the health inequalities faced by this population. Tilbury is one of the most deprived wards within Thurrock, with the most health needs. This should be fully accounted for in any conclusions drawn in this health assessment.

Of particular interest, we would like to understand more fully how engagement and consultation with the community will feed into the health assessment and the health outcome conclusions made within this report.

We would also like, as part of the socio-economic and amenity element, to touch on the Landscape and visual effects LVIA that is to be undertaken and suggest that consideration be paid to the potentially negative effects to emotional wellbeing and potential decrease in civic pride that could be felt by Thurrock residents through bad visual planning, as well as potential economic effects on the locality by the negativity of visitors from outside the borough to the historical sites and SSI areas. It is suggested that consultation with other developments in agreeing a plan around greening, colours and planting to be undertaken.

We hope that our above comments will be reviewed and included as deemed appropriate within the EIA and any subsequent planning application. If you wish to discuss any of the items raised within this consultation response please do not hesitate to contact us.

Yours Sincerely,

Sue Bradish
Public Health Commissioning Manager

Miles, Billy

From: Priestley, Brian on behalf of Regeneration.Delivery
Sent: 31 August 2018 14:28
To: Development.Management
Subject: RE: Planning Application Consultation. 18/4044/SCO

Categories: Orange Category

Thank you for consulting with the regeneration department about this scoping opinion.

Our response focusses issues relating to the social and economic impact.

Relevant Policy to be included in scope:

The Council's adopted Economic Growth Strategy and the Council's adopted Tilbury Master Plan provide context and details of the Council's approach to promoting economic growth and to regeneration in Tilbury. The policies contained in these adopted policy documents provide context and for the definition of scope for socio-economic impacts of the development

Issues to be included in scope :

The 'Scoping Document' submitted with the application refers to relevant issues. In addition to those identified in this document the following should also be considered in scope;

1. Impact on local employment including;
    a. Skills, linkages to local education programmes and opportunities for pathways in to employment, apprenticeships and training
    b. Addressing unemployment in the local area, Tilbury, and the wider Borough of Thurrock
2. Impact on local businesses and scope for supporting the local economy including;
    a. Supply chains and opportunities to facilitate procurement of services and facilities from the local area, Tilbury, and the wider Borough of Thurrock
3. Broader socio-economic impact on Tilbury and the wider Thurrock Borough through indirect impacts on local businesses and services generated by employees living in the locality and using local services.

General:

This is one of three NSIP's in the locality and so the cumulative impact of these on the local economy should be in scope.

Happy to discuss or provide more detail and clarification.

Kind Regards

Brian

Brian Priestley l Regeneration Programme Manager l Place Directorate thurrock.gov.uk l t +44 (0) 1375 652585 l Thurrock Council, Civic Offices, New Road, Grays, Essex RM17 6SL

An ambitious and collaborative community which is proud of its heritage and excited by its diverse opportunities and future

From: Stephen Vanstone [mailto:[redacted]]
Sent: 06 September 2018 09:43
To: Thurrock FPG
Cc: Thomas Arculus; Trevor Harris; Mariam Nagdi
Subject: RE: EN010092 - Thurrock Flexible Generation Plant - EIA Scoping Notification and Consultation

FAO - Emma Cottam,

I note that the development area includes an area within the River Thames. Therefore, Trinity House advise that any marine works below the high water mark should be fully assessed within a Marine Navigation Risk Assessment, provided as part of the Environmental Statement.

The Port of London Authority (PLA) should be consulted directly concerning the above, as well as any proposed risk mitigation measures relating to these marine works.

Kind regards,

Steve Vanstone
Navigation Services Officer

Navigation Directorate
Trinity House
Trinity Square
Tower Hill
London
EC3N 4DH

[redacted]

EIA Scoping Report

Thurrock Flexible Generation Plant

Land Adjacent to National Grid Substation, Tilbury

For Thurrock Power Limited



Quality Management

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Rev	**Date**	**Status**	**Reason for revision**	**Additional comments**
0	11/17	Draft	-	-
1	12/17	Draft	Working draft	-
2	12/17	Draft	Working draft	-
3	01/18	Draft	Client review	AT
4	02/18	Draft	Working draft	-
5	04/18	Draft	Complete working draft issued	-
6	06/18	Draft	Revised development design	-
7	07/18	Draft	Client review	AT
8	07/18	Final	Legal review	JB

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Non-Technical Summary

Thurrock Power Ltd proposes to develop a flexible generation plant on land north of Tilbury Substation in Thurrock. The flexible generation plant will provide up to 600 megawatts of electrical generation capacity on a fast response basis when called by the National Grid, together with up to 150 megawatts of battery storage capacity.

Figures 1 to 3 show the proposed development location, application boundary and indicative layout of the flexible generation plant.

The proposed development is a Nationally Significant Infrastructure Project for which Thurrock Power will make an application to the Planning Inspectorate for development consent. Thurrock Power intends to submit an appropriately scoped Environmental Statement with the Development Consent Order application, to report the assessment of likely significant environmental effects. This Environmental Impact Assessment Scoping Report is submitted to the Planning Inspectorate to request a Scoping Opinion from the Secretary of State in accordance with Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

The flexible generation plant is needed to provide resilience to the electricity grid when that is required due to unplanned outages and intermittent generation from renewable sources, particularly wind power, or short term demand from consumers (typically in the morning and evening, particularly in the winter). It will do so through providing peaking generation capacity from the fast-start gas engines, which will typically run for short periods. The battery storage facility will provide both electricity balancing and frequency management services for the grid.

The flexible generation plant itself will comprise reciprocating gas engines, batteries, and associated electrical and control equipment. A new permanent access road and potential temporary construction access roads, a gas pipeline connection to the gas national transmission system and potentially a cooling water pipeline to the River Thames will be developed. The electrical export connection will be via underground cables to the immediately adjacent National Grid Tilbury Substation.

Alternative sites and technologies for the proposed development have been considered by Thurrock Power. The proposed development site offers a suitable connection to the London 275 kilovolt transmission network at Tilbury Substation. The guidance of

national policy, consultation with National Grid and a detailed assessment of 'Best Available Technology' have together shown the clear need for a flexible generation plant using the technology proposed.

The application site comprises farm land, part in Common Land, in a setting that is a mixture of agricultural land uses to the north and east and significant existing infrastructure including the Tilbury Power Station site, a waste water treatment works and Tilbury Port to the south and west. The application site is mainly flat, with fields bounded by drainage ditches, crossed by several high-voltage electricity pylons (which are a visually dominant feature of the area) and to the north by the London, Tilbury and Southend Railway. The nearest nationally- and internationally-designated sites of nature conservation to the flexible generation plant itself (excluding the potential access routes, gas pipe and potential cooling water connection corridors) are on the banks of the River Thames, between two and three kilometres to the south and east. The nearest substantial residential area is Tilbury, at around 0.8 kilometres distance from the flexible generation plant.

This Environmental Impact Assessment Scoping Report has identified the potential for likely significant effects to arise from the construction, operation or decommissioning of the proposed development, prior to mitigation, through the following environmental pathways. The following specialist assessments are proposed to be scoped in to the Environmental Impact Assessment.

- Landscape and visual amenity
- Archaeology and cultural heritage
- Traffic and transport
- Land use, agriculture and socio-economics
- Air quality
- Onshore ecology
- Aquatic environment
- Habitats Regulations Assessment
- Noise and vibration
- Water resources and flood risk, including Water Framework Directive impacts

- Geology, hydrogeology and land contamination
- Climate change (greenhouse gas emissions)

The following environmental topic areas or specific impacts are proposed to be scoped out of the Environmental Impact Assessment, on the basis that no likely significant environmental effects are expected.

- Transboundary effects
- Operational traffic impacts
- Operational traffic noise impacts
- Operational vibration impacts
- White clawed crayfish, bat and otter surveys
- Saltmarsh, fish impingement and biocide assessment
- Climate change (vulnerability/adaptation of development other than flood risk)
- Environmental effect of vulnerability to major accidents or disasters (as a separate Environmental Statement chapter)
- Human health (as a separate Environmental Statement chapter)
- Waste management
- Material assets and natural resources (as a separate Environmental Statement chapter)
- Radiation, heat and light save for marine ecology heat impacts of water cooling, if proposed
- Aviation
- Combined Heat and Power (CHP) and Carbon Capture & Storage (CCS).

The approach to the Environmental Impact Assessment will follow good practice and professional guidance as detailed in this Scoping Report. Where significant adverse effects are identified, mitigation measures will be described where possible to reduce the residual effects. Enhancement measures to create or increase beneficial effects will also be identified where possible.

Potential for cumulative impacts with several other nearby major infrastructure projects that are in the process of applying for development consent has been identified and will

be assessed in the EIA. These include the ‘Lower Thames Crossing’ highway scheme, ‘Tilbury2’ port expansion and a thermal generation plant on the RWE Tilbury Power Station site.

This Scoping Report has been prepared as part of a request to the Planning Inspectorate for a formal Scoping Opinion on the information to be provided in the Environmental Statement, pursuant to Regulation 10 of the Infrastructure Planning (EIA Regulations) 2017.

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Appendix E: Baseline Sound Monitoring Report

Appendix F: Environmental Consultation Records

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1 Introduction

Background

1.1 RPS has been commissioned by Thurrock Power Ltd to prepare this Environmental Impact Assessment (EIA) Scoping Report to inform the scope and content of an EIA for a proposed flexible generation plant near Tilbury in Thurrock. The location of the proposed development site is shown in Figure 1.

1.2 Thurrock Power intends to submit an Environmental Statement (ES), which has been appropriately scoped, to report the assessment of likely significant environmental effects arising from the proposed development. The ES will accompany an application for a Development Consent Order (DCO) to construct and operate the proposed development.

1.3 The proposed development will provide up to 600 megawatts (MW) of electrical generation capacity and up to 150 MW of battery storage capacity on a fast response basis when called by the National Grid. It will provide resilience to the electricity grid when this is needed due to intermittent generation from other sources (such as wind power) or short term demand from consumers (typically in the morning and evening, particularly in the winter).

1.4 It will be constructed to the north of the decommissioned Tilbury coal-fired power station site, and will include a circa 2.5 km gas supply pipeline connection to Feeder 18 of the National Transmission System and a 275 kV underground cable connection to the adjacent existing 275/400 kV National Grid Tilbury Substation. It will potentially also include a circa 2.5 km cooling water pipeline to the Thames.

1.5 This scoping request includes plans identifying the application site land (Figures 1 and 2), a description of the proposed development, and a description of its possible effects on the environment.

1.6 The following information is shown on Figures 1 and 2:

- the proposed draft DCO site boundary (identified by a red line);
- potential areas of permanent land take required for the proposed development; and

- existing infrastructure which would be retained or upgraded for use as part of the proposed development [no existing infrastructure would be removed].

1.7 Areas of temporary land take required for construction, including construction compounds, would be within the development boundary shown in Figures 1 and 2, and are not identified separately on the figures at this stage.

1.8 Throughout this Scoping Report, the area marked 'A' on Figure 2 is referred to as the '**main development site**', on which the gas engines, batteries and associated electrical and control equipment would be built. A preliminary layout for the main development site is shown in Figure 3.

1.9 Other land within the application boundary for potential access road(s), gas and cooling water pipeline corridors, replacement common land and potential biodiversity enhancement, is shown on Figure 2 and referred to specifically by zone letter or description of the items of development where required in this Scoping Report. Further details of the elements comprising the proposed development are given in the project description in Section 3. Figures 5 and 6 show features including planning constraints and designated areas on and around the site.

1.10 This Scoping Report considers the environmental context of the site and the potential environmental impacts of the proposed development. Where the potential to cause significant environmental effects is identified, initial consideration of possible mitigation of such effects is made. This report also identifies issues that are considered not likely to be significant and which are proposed to be scoped out of the EIA process.

1.11 EIA is an iterative process that feeds into the design to mitigate significant environmental effects where they are predicted to occur. The final design, along with the findings of the EIA will be reported in the ES, in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') and will be submitted with the DCO Application in accordance with Regulation 5 (2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 as amended ('APFP Regulations').

Consenting Regime

1.12 The proposed development will be a 'nationally significant infrastructure project' (NSIP) under Section 14(1)(a) and 15(2) of the Planning Act 2008 (as amended) as a 'generating station exceeding 50 MW'. As a "*Thermal power station … with a heat output of 300 megawatts or more*", it is 'Schedule 1' development under the EIA Regulations. As such, an EIA is required for the proposed development and an ES must be prepared to accompany the DCO application.

1.13 As a NSIP project, Thurrock Power is required to seek a DCO to construct and operate the power station, under Section 31 of the Planning Act 2008. The DCO application will be submitted to the Planning Inspectorate (PINS) who will examine the application and make recommendations to the Secretary of State, who will subsequently determine whether or not a DCO should be granted for the proposed development.

1.14 Figure 1 illustrates the proposed application site boundary, which comprises the proposed generating station and associated infrastructure including road access, electricity, gas and potential cooling water connections. Descriptions of the existing environment and the proposed development are in Sections 2 and 3 of this report.

1.15 This Scoping Report constitutes Thurrock Power's notification under Regulation 8(1)(b) of the EIA Regulations that it intends to provide an Environmental Statement in respect of the proposed development.

Consultation to Date

1.16 Prior to submitting this scoping request, Thurrock Power has undertaken informal consultation with the following parties (which is ongoing).

Table 1.1: Parties consulted to date

Party	Contact	Date first consulted
Anglian Water	James Tilbrook	30th November 2016
BEIS	Gemma Huett	6th September 2017
Environment Agency (air quality)	John Henderson and Richard Chase	30th August 2017
Environment Agency	John Henderson and	30th August 2017

(other topics)	Richard Chase	
Essex County Council – SUDS	Tim Simpson	17th August 2017
Highways England	Reuel Abrams and Sue Howe	12th July 2017
HSE	Peter Rastall	17th August 2017
Land owners	Coles and Motts	February 2017
National Grid (electrical connection)	Grahame Neale	10th January 2017
National Grid (gas feeder)	Robert Bood and Ed Timerick	1st September 2017
National Grid (PARCA capacity)	Richard Hounslea, Stephen Ruane and Eddie Blackburn	21st July 2017
Natural England and Essex Wildlife Trust	Jonathan Bustard	14th July 2017 12th March 2018
Network Rail	Jason Dickson, Paul Spencer and Randeep Bilkhoo	29th August 2017
Open Space Society (Common Land)	Hugh Craddock	12th January 2017
PINS	Mark Wilson, K J Johansson, Chris White, Richard Price and David Price	14th October 2016
Port of Tilbury London Ltd	Peter Ward	23rd November 2016
RWE	John Howell, Matthew Trigg and Severine Poncelet	16th December 2016
Thurrock Council (17/30001/PMA5)	Matt Gallagher Mark Gentry	6th January 2017 18th January 2018

1.17 Of these parties, Natural England has been consulted regarding the scope of proposed ecological baseline surveys through a meeting and correspondence in early 2018 with Jonathan Bustard, Casework Manager for West Anglia & Norfolk / Suffolk. Subsequently, initial findings of the surveys and potential

mitigation/enhancement opportunities have been discussed. Thurrock Council (Mark Gentry, Environmental Health Officer) was consulted in January 2018 regarding the baseline noise survey methodology. Records of this consultation concerning environmental assessment topics are included at Appendix F.

1.18 Consultation on the EIA scope and approach with other relevant bodies is sought through the EIA scoping process.

1.19 With regard to the other parties listed in Table 1.1 consulted to date, Gemma Huett, Head of Flexibility Markets/Electrical Systems at the Department for Business, Energy and Industrial Strategy was contacted in August 2017 regarding plans for the development. Advice was sought in respect of BEIS' strategic/policy view and also considerations Thurrock Power should be aware of when developing the proposed development. Consultation took place at a meeting on 6th September 2017.

1.20 John Henderson and Richard Chase of the Environment Agency were consulted by Thurrock Power at a meeting on 30th August 2017. The purpose of the meeting was for Thurrock Power to introduce the proposed development in order for Thurrock Power to understand the Environment Agency's position on the development proposals.

1.21 Essex County Council Sustainable Drainage Systems was consulted initially by way of correspondence with Tim Simpson, Development and Flood Risks Manager, on 17th August 2017. This was followed by a meeting at the end of August 2017, in advance of which Thurrock Power provided an initial drainage strategy and topographic plan of the development site.

1.22 Highways England was consulted in July 2017 regarding the need for the development to run services underneath an area safeguarded by the Lower Thames Crossing.

1.23 Consultation took place with the Health and Safety Executive Land Use Planning Support Team in August 2017 relating to Thurrock Power's wish to make a connection to the gas National Transmission System in a field subject to an option to develop housing. HSE advised that the proposed development site was affected by HSE Consultation Zones for a Major Accident Hazard Pipeline and also that it came within an HSE Explosive Zone.

1.24 Thurrock Power consulted Network Rail at the end of August 2017 regarding the routing of abnormal loads from either the Port of Tilbury or the London Gateway Port.

1.25 Hugh Cradock of the Open Spaces Society was contacted by email on 12th January 2017 with a view to arranging a telephone call to discuss OSS' views on the proposed development.

1.26 With regards to the Planning Inspectorate, a meeting took place on 14th October 2017 where Thurrock Power introduced the proposed development and discussed potential environmental impacts and the approach to be taken in respect of EIA.

1.27 Port of Tilbury London Limited was consulted in March 2017 regarding air quality data in relation to the proposed development and its relationship with Tilbury 2.

1.28 There has been regular and ongoing contact with RWE since early 2017 in connection with EIA related issues and environmental data.

Objectives of Scoping

1.29 This Scoping Report has been prepared as part of a request to PINS for a formal Scoping Opinion on the information to be provided in the ES, pursuant to Regulation 10 of the EIA Regulations.

1.30 Table 1.2 presents a list of information that should be included in a Scoping Report, as prescribed by Regulation 10 and as highlighted in PINS Advice Note 7 'Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements' [1], and the location in this report where the information is presented.

Table 1.2: Summary of scoping information provided and where presented

Description of Information Required	Section in Scoping Report where the Information is Presented
Plan(s) showing: ▪ the DCO site boundary and associated development; ▪ permanent land take required for the proposed development; ▪ temporary land take required for construction, including construction compounds; ▪ existing infrastructure which would be retained or upgraded for use as part of the proposed development; ▪ existing infrastructure which would be removed; and ▪ relevant features including planning constraints and designated areas on and around the site, such as national parks or historic landscapes	Figures 1 to 16
Referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development	See above
A description of the Proposed Development, including its location and technical capacity; An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development eg design parameters	Section 3: Project Description

Description of Information Required	Section in Scoping Report where the Information is Presented
An explanation of the likely significant effects of the development on the environment Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect eg criteria for determining sensitivity and magnitude	Section 7: Summary of Proposed EIA Scope Section 8: Identification of Potentially Significant Environmental Impacts (including desktop or baseline data and assessment methods) Section 6: EIA Process (overview of approach to assess impacts and determine significance)
An outline of the reasonable alternatives considered and the reasons for selecting a preferred option	Section 5: Need and Alternatives
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided	Section 7: Summary of Proposed EIA Scope Section 9: Identification of Non-Significant Environmental Topics
Guidance and best practice to be relied upon and whether this has been agreed with the relevant bodies	Section 8 for each environmental topic sets out the proposed approach and references to guidance or best practice. Table 1.1 and accompanying text above detail consultation to date
Any avoidance or mitigation proposed and predicted residual impacts	Section 8 sets out potential mitigation considerations within the EIA topic sub-headings. However, identifying specific necessary mitigation and predicting residual effects is a purpose of EIA process, which will be undertaken subsequent to the scoping stage

Description of Information Required	Section in Scoping Report where the Information is Presented
An outline of the structure of the proposed ES	Section 6: EIA Process, subsection Structure of the Environmental Statement Section 7: Summary of Proposed EIA Scope

2 Description of the Existing Environment

Introduction

2.1 This section provides an overview of the existing environment within the application boundary and the wider setting of the application site. Greater detail of baseline environment is provided EIA topic by topic in Section 6.

2.2 The land within the application boundary comprises a '**main development site'**, on which the gas engines and batteries would be built, and further land for access, gas, electricity and potential cooling water connections, replacement common land and potentially biodiversity enhancement. Specifics are given in the project description in Section 3. Distances to and descriptions of features of the existing environment are generally given relative to the main development site boundary in this section unless otherwise specified, but the existing environment and setting of all land within the application boundary are also described.

Location

2.3 The proposed main development site is located on land south west of Station Road near Tilbury, Essex, and comprises undeveloped land with no current buildings. The location and application boundary are shown in Figure 1. The British National Grid coordinates are TQ662766 and the nearest existing postcode is RM18 8UL.

2.4 The main development site is around 18 ha in size and the entire area within the draft application boundary is around 182 ha. The main development site is approximately 800 m east of the edge of Tilbury, with its immediate surroundings being agricultural land save for the National Grid 275 kV Tilbury Substation immediately to the south and railway line passing through the application site boundary to the north of the main development site.

Local Planning Authority

2.5 The site is located within the administrative area of Thurrock Borough Council (TBC). The entire application site is within the Thurrock Green Belt.

Site Description

2.6 The main development site currently comprises open fields crossed by three overhead power lines with steel lattice electricity pylons. It is immediately to the north of the existing Tilbury Substation and site of the decommissioned Tilbury coal fired power station, with the River Thames further to the south. Substantial development is envisaged in the area with the proposed extension of Tilbury Port to the west, redevelopment of Tilbury Power Station, and Lower Thames Crossing major highway scheme among other proposals. Further details of potential cumulative developments are given in Section 6.

2.7 Part of the main development site is known as Walton Common (registered common land number CL228). It forms part of the common known as The Green, Hall Hill, Fort Road, Parsonage, Walton and Tilbury Fort Commons (ID 33611).

2.8 The other land within the application boundary generally comprises grass or arable fields separated by drainage channels and some man-made ponds, predominantly Agricultural Land Classification (ALC) Grade 3 (Good to Moderate).

2.9 A photograph of the main development site in its baseline condition, looking north from close to Tilbury Substation, is shown in Figure 4.

Access

2.10 Existing access to the application site is via a farm track to Station Road, which then connects to East and West Tilbury. To the north, the A13 dual carriageway provides a strategic highway route to the M25 and London.

2.11 A section of the London, Tilbury and Southend Railway (LTSR) known as the Tilbury Loop passes through the application site in a south-west to north-east alignment, providing commuter passenger services between central/east London and locations Essex. It has a number of at-grade level crossings, with the closest public highway crossing to the main development site at Station Road. There is also a farm track level crossing north of the main development site.

2.12 There are a number of public rights of way (PRoWs) within the vicinity of the application site (to the north of the railway and the coast path on the Thames bank),

though none within the main development site. These link the nearby residential areas and providing connections to the River Thames to the south.

Site Setting

2.13 In the area immediately surrounding the main development site are the following, as illustrated in Figures 5 and 6.

Residential areas

2.14 The eastern edge of Tilbury is approximately 800 m north west of the main development site, the village of West Tilbury is approximately 1.25 km to the north and East Tilbury village is approximately 2.1 km to the east.

2.15 In addition, there are a number of individual or small groups of houses within around 800 m of the main development site, the nearest being:

- Walnut Tree Farm and Low Street (600 m north east);
- Condovers Cottages (715 m north east);
- Polwicks (750 m north east);
- West Cottages (790 m north east);
- St James Church (790 m north);
- Byron Gardens (700 m west);
- Brennan Road (750 m west); and
- Sandhurst Road (770 m west).

Nature Conservation Setting

2.16 'Mucking Flats and Marshes' Site of Special Scientific Interest (SSSI), a component site of the Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar site, lies approximately 2.6 km east of the main development site. 'South Thames Estuary and Marshes' SSSI is approximately 2.8 km from the main development site at closest approach, to the south and east.

2.17 There are two other SSSIs within 5 km: Hangmans Wood and Deneholes SSSI, located approx. 4 km to the north west; and Globe Pitt SSSI, again approx. 4 km to the north west of the main development site.

2.18 The Thames Estuary Recommended Marine Conservation Zone (MCZ) comprises the River Thames and is approximately 1.25 km south of the main development site at closest approach.

2.19 There are two local wildlife sites close to the main site of development. The first of these is known as Lytag Brownfield Site and is approx. 200 m to the west of the site. The second is known as The Tilbury Centre and is located approx. 500 m south west of the site.

Landscape or Townscape and Cultural Heritage Setting

2.20 The application site generally comprises virtually flat fields. The boundaries are defined by large drainage ditches. There are few trees on the fields, typically confined to the boundary ditches. Some of the fields making up the application site are crossed by high voltage overhead transmission lines and supporting towers. The landscape to the north and east is rural, but substantial existing electricity generation infrastructure lies immediately to the south. The main development site and surrounding land is crossed by a number of high-voltage overhead electricity transmission lines, which are a visually dominant feature of the area.

2.21 The main development site is bordered to the west by a wide strip of fields of similar character for around 800 m between the site and Fort Road, which borders the urban edge of Tilbury.

2.22 The site lies within National Character Area profile 81, ‘The Greater Thames Estuary’ (NE473); South Essex Coast Landscape Character Area ‘Tilbury, Mucking and Fobbing Marshes’; and Local Character Area ‘Tilbury Marshes’. ‘Tilbury and Docks Urban Areas’ lies to the west while the ‘Chadwell Escarpment’ lies 800 m to the north.

2.23 The main development site is not crossed or bordered by public footpaths or highways.

2.24 The application site lies within a culturally rich area with numerous heritage assets, the most important of which relate to the strategic importance of the River Thames and its function as the maritime approach into London. Their setting has been affected by 20th Century developments such as Tilbury Power Station, flood

defences, Tilbury Docks, residential and industrial development. Key known heritage assets within 1 km of the main development site comprise:

Scheduled Monuments

- Tilbury Fort (960 m south west)
- Earthworks near church, West Tilbury (730 m north)

Listed structures

- West Tilbury Hall and barn – Grade II (830 m north)
- Church of St James – Grade II* (790 m north)
- Walnut Tree Cottage – Grade II (660 m north east)
- Polwicks – Grade II (750 m north east)
- Buckland – Grade II (990 m east)

Hydrological, Hydrogeological and Geological Environment

2.25 The main development site is underlain by alluvium (soft clay with peat beds) over River Terrace Deposits. Bedrock beneath the site is chalk (undifferentiated from the Cretaceous Period).

2.26 There appear to have been no anthropogenic activities on the site other than for farming and the construction of overhead power lines. Immediately to the east of the site there are areas designated as active and former landfills by the EA.

2.27 The superficial Alluvium is classified by the EA as a Secondary (undifferentiated) Aquifer. The River Terrace Deposits are classified as a Secondary A Aquifer and the White Chalk Subgroup bedrock is classified as a Principal Aquifer.

2.28 The main development site is not located in a Groundwater Source Protection Zone. Natural England MAGIC website [2] indicates that the main development site does not lie within a Groundwater Drinking Water Safeguard Zone or a Surface Water Safeguard Zone.

2.29 There are two records of groundwater abstraction licenses located about 1.4 km to the north east of the main development site. One is classified as a large abstraction and is used for industrial (petrochemical) use and the other is a medium sized extraction used for farming/irrigation use.

3 Project Description

Overview and Site Layout

3.1 The proposed development comprises the construction and operation of:

- reciprocating gas engines with rated electrical output totalling 600 MW;
- batteries with rated electrical output of 150 MW and storage capacity of up to 600 MWh[1];
- gas, electricity and potential cooling water connections, private access road(s) and minor public highway widening for delivery of large loads;
- designation of replacement common land (exchange land) and possible creation of habitat for protected species translocation; and
- possible transfer of land to Thurrock Council for planning gain.

3.2 The proposed development will be designed to operate for at least 35 years, after which ongoing operation and market conditions will be reviewed. If it is not appropriate to continue operating after that time, one or both facilities (gas engines or batteries) will be decommissioned.

3.3 Gas will be supplied via a new pipeline connection from the existing National Grid Transmission gas network (Feeder 18) approximately 2 km to the north east of the main development site as the crow flies. The pipeline route is approximately 2.5 km in length. Electricity will be exported via the existing National Grid 275/400 kV substation located adjacent to the application site, immediately to the south. The connection to the substation over this short distance will be made with underground cables.

3.4 The gas engines are provided with air cooling heat exchangers but it is the applicant's intention to also consider the option of 'once through' water cooling as an alternative to air cooling. Once-through cooling would employ water from the Thames, with an intake and discharge point around 1.5 km south east of the main

[1] i.e. storing up to four hours' power at maximum discharge capacity

development site as the crow flies. The cooling pipe route would be up to around 2.5 km in length.

3.5 The proposed development will also include the removal of certain pinch points on the road access to Orsett Cock A13 junction, the designation of land to the north of the railway for replacement common land and the possible use of land by Thurrock Council for community benefit.

3.6 The application boundary encompassing all of these elements is shown in Figures 1 and 2.

3.7 This figure also identifies the '**main development site**' (marked 'A' on Figure 2), which is land to the north of the existing National Grid Tilbury substation within which the principal built elements of the proposed development will be constructed. Within the main development site, the proposed development will comprise a range of buildings, structures and apparatus for the gas engines, batteries and electricity and gas connection points. These are listed in Table 3.1.

Table 3.1: Built development elements on main development site

Reciprocating gas engines	Up to 60 gas engines and generators with heat exchangers and cooling fans (mounted over one or more of the groups of engines) or pipework and equipment for once-through water cooling Up to 60 gas engine exhaust stacks (which may be aggregated into fewer stacks) up to 40 m high Engine lubricant storage and engine selective catalytic reduction (SCR) reagent storage Gas reception compound, control equipment, heating and distribution system Workshop and stores Electrical switchgear
Battery storage	Either a design based around freestanding prefabricated units consisting of: • a number of battery 'e-houses', in the order of 52 freestanding units similar to double-width containers which may be stacked two high, with roof-mounted air conditioning heat exchangers, the final number and dimensions being subject to detailed design; and • containerised transformer and power conversion system units to provide electrical connection between electricity network and batteries; or, a purpose-built building containing the above equipment, each

	options taking up the same space allocated on the site. Electrical switchgear and control equipment
Other elements	11 kV, 33 kV, 132 kV and 275 kV step-up substations with relays, transformers and associated equipment Switchgear buildings at 11 kV and 33 kV Control room and administrative building with welfare facilities Fire water tank Surface water drainage and runoff controls Internal access roads and car parking with around 30 spaces Gatehouse, security fencing, lighting and CCTV

3.8 A preliminary layout for the main development site is shown in Figure 3. This preliminary layout is subject to change following consultation with stakeholders and ongoing technical and environmental studies, but as currently designed shows the expected location and space requirements within the application site of the main development elements – gas engines, batteries, runoff attenuation, substation, and electricity, cooling water and gas connection points – responding to currently known site constraints.

3.9 For the purpose of this EIA Scoping Report, i.e. to give initial consideration to potential for likely significant environmental impacts and to request the Secretary of State's opinion on the scope of the EIA, an outline design envelope for the proposed development has therefore been defined. This envelope sets out the currently envisaged maximum parameters relevant to potential environmental impacts, which are detailed in Table 3.2.

3.10 Due to the ongoing need for flexibility to accommodate further technical developments, the applicant will also seek to use a Rochdale Envelope approach in the EIA process following receipt of the Scoping Opinion. The envelope is expected to be no greater than that defined in Table 3.2 and would be refined wherever greater certainty about the design of elements of the proposed development is possible.

Table 3.2: Development envelope

Main development site area	Approx. 18 ha, marked as area 'A' on Figure 2, within overall application boundary of approx. 182 ha
Gas engines	Up to 60 units contained within four purpose built buildings, each building being up to around 50 m by 125 m and 15 m high (including top-mounted cooling)
Gas engine stacks	Up to 60 stacks each up to 40 m high
On-site substations	Two series of switchgear (see paragraph 3.20) up to 275 kV
Batteries	A number of individual battery units or a single building collectively up to 120 m by 75 m and 10 m high
Gas pipeline construction	Up to 20 m wide working corridor, trench up to 4 m depth
Cooling pipeline construction	Up to 30 m wide working corridor, trench(es) up to 10 m depth
Access road(s) for construction	Up to 20 m wide working corridor(s) for new access road(s) to be constructed on private land
National Transmission Network connection above-ground installation (Area E)	50 m x 50 m compound, buildings and equipment up to 6 m height

3.11 The proposed development will not generate waste water (aside from potentially cooling water) or process effluent during normal operation. Clean surface runoff will be to the existing watercourse, controlled via sustainable drainage (SuDS) features (e.g. runoff attenuation ponds) and/or hydrobrake as required. Potential space for attenuation ponds is shown indicatively on Figure 3, with the size and design of such features to be confirmed following flood risk assessment and further drainage design.

Reciprocating Gas Engines

3.12 The energy network is undergoing a transformation from incumbent conventional baseload generation to intermittent renewables. While some renewables can generally be predictable (e.g. solar, hydro), a large amount is not: particularly onshore and offshore wind, but even slight variations in solar irradiance and temperature can vary solar photovoltaic output.

3.13 The proposed 'fast start' gas reciprocating engines can be used to assist in the transition to an electricity supply with the majority of generating capacity provided by renewable sources. During periods of low renewable electricity generation, whether predictable or not, the proposed development's gas engine generators can quickly support the network and ensure consumers receive the electricity they need.

3.14 The proposed development's gas engines will be used intermittently, firing up when National Grid requires some or all of them to do so. Compared with conventional baseload generation, which cannot increase or decrease output quickly, this plant will provide National Grid with the necessary flexibility it needs to in transforming electricity system.

3.15 Aside from supporting National Grid in the balancing mechanism, the applicant also expects that this asset would enter the electricity reserve market, providing reliable support in periods of tight capacity margins, as well as offering black start capabilities (i.e. the ability to help the National Transmission System re-energise in the event of a total or partial shutdown).

3.16 The total generation capacity of 600 MWe will be provided by up to 60 individual gas engines of between 10 and 15 MWe capacity (with appropriate de-rating), each comprising the engine itself, electrical generator, air or water cooling system and exhaust stack. The gas engines will typically be rated at a lower an efficiency of 48-50% efficiency[2], depending on the manufacturer and engine model. The gas engines and associated equipment will either be in a building or grouped together to collectively comprise a structure with outline dimensions as given above. The engine exhausts may be individual stacks for each engine or aggregated into fewer stacks, in either case up to 40 m in height.

3.17 The maximum operating time of the gas engines per year could be up to 2,750 hours, subject to agreement with the Environment Agency.

[2] lower heating value, ISO3046 test conditions

Electricity Substations and Grid Connection

3.18 The proposed development will connect to the existing National Grid Tilbury 275 kV substation, which is adjacent to the southern boundary of the main development site, via a short section of underground cable(s) lying within the boundary of the main development site and the existing National Grid substation site.

3.19 No changes are proposed to the existing high-voltage overhead lines crossing the main development site or other land within the application boundary. The indicative development layout shown in Figure 3 takes account of safe clearance zones around the existing electricity pylons and overhead wires on the main development site, which will remain in place.

3.20 Within the main development site will be two series of switchgear, step-up transformers, breakers, disconnectors, current and voltage transformers and relays (collectively the switchgear) to connect the gas engines and batteries to the 275 kV underground export cable(s) that will in turn connect into the National Grid substation adjacent to the south. These two series of switchgear will consist of:

- 33 kV switchgear houses, two 33 kV to 132 kV step-up transformers and associated switchgear, and one 132 kV to 275 kV step-up transformer and switchgear for batteries; and
- six 11 kV to 132 kV step-up transformers and associated switchgear, and two 132 to 275 kV step-up transformers and associated switchgear.

Gas Connection

3.21 A new gas pipeline connection to the National Grid Transmission Gas Network at Feeder 18 will be required. Feeder 18 is approximately 2 km away from the main development site to the north east. A corridor for routing the gas pipeline through agricultural land as far as Station Road is marked as area ‘C’ on Figure 2. The pipeline is then proposed to be routed in a south easterly direction under Station Road for around 700 m. Where Station Road turns north east, the pipeline may continue under the road or may be routed through the adjacent agricultural land to the north or south of the road, marked as area ‘D’ on Figure 2.

3.22 The final route to the connection point will need to be kept under review as land along the route of Feeder 18 is subject to a residential development option being agreed with the landowner and proposals are currently being promoted in Thurrock Council's Issues and Options Paper for the Local Plan. It is not anticipated that there will be any difficulty defining a route for the pipe to the connection compound within area D, but the route will take account of residential development plans if these become sufficiently progressed.

3.23 Finally, the pipeline will connect to Feeder 18 where it runs within a field at area 'E' on Figure 2. The connection itself will comprise an above-ground junction point with instrumentation kiosks and emergency pressure release valve set in a compound approx. 50 m square with security fence, potential screening planting, and access road to the public highway.

Gas Engines' Cooling

3.24 The gas engines are provided with air cooling heat exchangers with fans likely to be mounted above each of the engines or on the ground if space permits.

3.25 It is the applicant's intention to consider the option of 'once through' cooling water as an alternative to air cooling. The gas engines will be designed to allow both options, which are being studied by the applicant to consider the preferred solution, taking into account the different effects on energy efficiency and potential environmental impacts of each option.

3.26 The applicant may select a preferred solution during subsequent stages of the pre-application process, may seek development consent for both options within the project design envelope, or may make a local authority Town and Country Planning Act application outside the DCO consenting regime for the cooling water connection as 'associated development'. For the purpose of EIA scoping, therefore, both options are considered and either or both may be assessed in the EIA process subject to the decisions as set out above.

3.27 Once-through water cooling would use water abstracted from the Thames, circulated through heat exchangers for each gas engine and returned to the Thames for discharge. This would require two sets of buried pipes to form the cooling water circuit between the main development site and an intake/discharge

point to be constructed below the low water line on the bank of the Thames. The proposed areas in which the intake/discharge point and cooling pipeline could be developed are shown in Figure 2.

3.28 The cooling pipeline route would be around 2.5 km long. It would generally follow the route of haul roads that form part of the Goshen Farm land raising operation to the east of the main development site, in order to minimise disturbance to that land-raising or excavation into the underlying historical landfills.

Access

3.29 The main requirement for access to the site is during the construction phase. During operation, access is needed mainly for occasional maintenance, as the plant is designed for remote operation and will not have a large regular workforce on site day to day.

3.30 Several road access options are being considered.

3.31 The primary permanent access option is from the A13 turning south at the Orsett Cock interchange (A13/A128), avoiding Chadwell St Mary and West Tilbury, which provides access to an existing level crossing of the railway line at Station Road. Immediately after this level crossing, a private access road would then be constructed in the corridor area 'C' on Figure 2 to the main development site. This may follow the alignment of an existing farm track that runs through that land.

3.32 The sections of this route on public highways (marked 'H' on Figure 2) have been included within the application boundary because a number of pinch points would require widening to allow the passage of HGV traffic and anticipated abnormal loads (e.g. delivery of transformers). A swept path analysis for the largest piece of equipment and transporter has been undertaken to inform the requirement or otherwise for road widening. The analysis suggests 10 points where additional land will be required for road widening, shown in Figure 15.

3.33 Alternatively, a new permanent road could be constructed running south of Coopers Shaw Road to an existing farm track level crossing of the railway north of the main development site. A land corridor for this option is marked as area 'I' on Figure 2. This would be a more direct route, avoiding one pinch point at the Coopers Shaw

Road – Church Road junction, but use of the farm track level crossing for construction and operational traffic would require further study.

3.34 Area I may also be used as a temporary laydown area for items such as gas engines and transformers, which could be lifted across the railway using a tower crane to be constructed there temporarily.

3.35 In the construction phase, the applicant will consider the option to use barge delivery on the Thames where possible for bulk materials such as aggregates. This access route would be within the area marked as 'K' on Figure 2. It would involve temporary use of the existing haul roads[3] present for the Goshen Farm land raising operation to the east of the main development site and construction of a new temporary access road between the land raising operation site and the proposed main development site. Either the existing jetty and offloading facilities of the land-raising operation, or the consented larger jetty and pontoon[4], if constructed, would be used.

3.36 A further temporary access for the duration of the construction phase may be developed from the public highway at Station Road running south-east to the potential cooling water pipeline route, marked as area 'L' on Figure 2. This would facilitate more direct access by HGVs and construction plant to the cooling pipe route for construction of the pipe. It would also allow HGVs to access this area for use in transporting material between the jetty and main development site.

Other Land Uses

3.37 Because construction on the main development site would mean loss of Walton Common land and potentially, depending on the access road route, part of Parsonage Common, land for replacement commons has been identified within the application boundary at areas 'F' and 'G' on Figure 2. These areas of land may also be suitable for habitat creation to mitigate loss of habitat on the main development site or to allow for protected species relocation should this be necessary.

[3] a corridor considerably wider than the existing haul roads is shown on Figure 2 as this is also the corridor for the potential cooling water pipe route
[4] Thurrock Council planning reference 17/00224/FUL

3.38 Area ‘J’ on Figure 2, between the southern edge of Tilbury and Tilbury Fort, may be offered to Thurrock Council for a community use, the details of which are under discussion. This will not include any built development forming part of this application for development consent.

Approach to Uncertainties

3.39 The sections above have described elements of the proposed development subject to change during ongoing design work or where more than one option is being considered. These uncertainties, if not resolved prior to publication of the Preliminary Environmental Information Report (PEIR) for consultation, or prior to submission of the application, would be addressed in the EIA process as follows.

Table 3.3: Design envelope uncertainties and approach for EIA

Option or uncertainty	Approach to assessment
Layout of main development site	Worst-case design envelope for each element will be assessed, within which changes to layout of components and equipment would not have greater potential for impacts. Main development site area (Zone A on Figure 2) is not expected to change.
Structures on main development site	Worst-case of freestanding equipment or equipment within buildings assessed (mainly affecting visual impact) within dimensional envelopes defined in Table 3.2.
Access road options	All options will be assessed. Worst-case will be defined per topic or impacts of more than one option may be assessed where necessary within a topic (e.g. where worst-case impacts affect different receptors).
Gas pipe route corridor and connection compound location	Worst-case options for pipe route and compound location, within the corridors/zones defined in Figure 2, will be defined and assessed per topic.
Number and height of gas engines' stacks	Worst-case design envelope defined in Table 3.2 will be assessed
Gas engines' cooling options	Air-cooled and water-cooled options will be assessed. Worst-case will be defined per topic or impacts of both options may be assessed where necessary within a topic (e.g. where worst-case impacts affect different receptors).
Future carbon capture and storage	Impact of land-take for area reserved for future CCS will be assessed. Future CCS infrastructure design, construction and operation (including any off-site pipeline infrastructure), were this to occur, is unknown and cannot be defined sufficiently for meaningful EIA so will not be assessed.

Construction Programme and Management

3.40 Subject to being granted development consent and subsequent Final Investment Decision, the proposed development will be capable of operation by December 2021. This follows a construction period of up to around 12 months, which will start with ground preparation works in early 2021. National Grid will have completed necessary works for the proposed development's electrical export connection within

Tilbury Substation by late 2020. In overview, the construction programme is expected to be as follows:

- 2020: common land and habitat creation/enhancement, if required, outside main development site;
- Q1 2021: main development site preparation and ground works, creation of construction access road and widening of pinch points on public highway, start of gas and (potentially) cooling water pipeline trenching (subject to potential seasonal constraints);
- Q2 2021: construction/installation of gas engines, batteries and associated equipment; connection of gas supply pipeline and electricity export cable(s); (potentially) construction and connection of cooling water pipeline;
- Q3 2021: commissioning and energisation; completion of landscaping and permanent access road(s);
- Q4 2021: facility is available for operation.

3.41 The ES will provide further details of the proposed construction activities, methods and their anticipated duration, along with an indicative programme of each phase of the works.

3.42 The ES will also be supported by a Code of Construction Practice (CoCP) and outline Construction Environmental Management Plan (CEMP), which will describe the specific mitigation measures to be followed to reduce potential environmental or nuisance impacts from:

- use of land within the application boundary for temporary laydown areas, materials storage, site offices or accommodation;
- construction traffic (including parking and access requirements);
- construction in the aquatic environment (if proposed);
- earthworks;
- noise and vibration;
- dust generation; and
- waste generation.

3.43 Contracts with companies involved in the construction works will require adherence to environmental controls including the CoCP and CEMP, health and safety regulations and current good practice guidance. All construction works will adhere to the Construction (Design and Management) Regulations 2015 (CDM) or as amended.

Decommissioning

3.44 The proposed development is expected to operate for at least 35 years. Extension beyond this timescale will be dependent on prevailing market conditions. The assets if in continuing use would be upgraded and follow any necessary approvals process in place at that time.

3.45 The facility will be developed in a modular fashion and would be capable of being decommissioned and deconstructed non-intrusively. Should the facility be decommissioned, all above ground structures would be removed from the site, with the maximum value being recovered from materials and equipment via re-use or recycling at the time. The decision on how much of the below ground infrastructure would be retained would be agreed with the landowner and any other interested parties, accounting for decommissioning methods and timescales at the time.

4 Planning Policy

National Policy Statements

4.1 The policy framework for examining and determining applications for NSIPs is provided by National Policy Statements (NPSs). Section 104 of the Planning Act 2008, as amended, requires the Secretary of State to determine applications for NSIPs in accordance with the relevant NPSs, unless this would:

- lead to the UK being in breach of its international obligations;
- be in breach of any statutory duty that applies to the Secretary of State;
- be unlawful;
- the adverse impacts of the development outweigh its benefits; or
- be contrary to any regulations that may be made prescribing other relevant conditions.

4.2 There are several NPSs relating to nationally significant energy infrastructure. The NPSs that are considered to be of relevance to the proposed development are:

- Overarching National Policy Statement for Energy (EN-1) [3];
- National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2) [4];
- National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) [5]; and
- National Policy Statement for Electricity Networks Infrastructure (EN-5) [6].

4.3 These documents frame the planning policy perspective for this type of development, with EN-2 being the most relevant, given the small scale of gas and electricity grid connection required at this location.

4.4 Part 4 of EN-1 sets out a number of ‘assessment principles’ that must be taken into account by applicants and the Secretary of State in preparing and determining applications for nationally significant energy infrastructure. General points include (paragraph 4.1.2) the requirement for the Secretary of State, given the level and urgency of need for the infrastructure covered by the energy NPSs, to start with a

presumption in favour of granting consent for applications for energy NSIPs. This presumption applies unless any more specific and relevant policies set out in the relevant NPS clearly indicate that consent should be refused or any of the considerations referred to in Section 104 of the 2008 Act (noted above) apply.

4.5 Paragraph 4.1.3 goes on to state that in considering any project, and in particular, when weighing its adverse impacts against its benefits, the Secretary of State should take into account:

- its potential benefits, including its contribution to meeting the need for energy infrastructure, job creation and any long-term or wider benefits; and
- its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.

4.6 Paragraph 4.1.4 continues by stating that within this context the Secretary of State should take into account environmental, social and economic benefits and adverse impacts, at national, regional and local levels.

4.7 Other assessment principles include the matters to be covered within any ES; the Habitats and Species Regulations; the consideration of alternatives; criteria for 'good design'; consideration of combined heat and power (CHP); consideration of carbon capture and storage (CCS) and carbon capture readiness (CCR); climate change adaptation; and grid connection, amongst others.

4.8 Part 5 of EN-1 lists a number of 'generic impacts' that relate to most types of energy infrastructure, which both applicants and the Secretary of State should take into account when preparing and considering applications. These include air quality and emissions; biodiversity; landscape and visual impacts; and flood risk impacts, amongst others. Paragraph 5.1.2 stresses that the list of impacts is not exhaustive, and that applicants should identify the impacts of their projects in the ES in terms of both those covered by the NPSs and others that may be relevant. In relation to each of the generic impacts listed within Part 5 of EN-1, guidance is provided on how Thurrock Power should assess these within its application and also the considerations that the SoS should take into account in decision-making.

4.9 In addition to a number of the assessment principles and generic impacts covered by EN-1 (where relevant to fossil fuel generating stations), EN-2, EN-4 and EN-5 set out the factors (e.g. factors influencing site selection) and 'assessment and technology specific' considerations to be taken into account in the preparation and assessment of applications for fossil fuel generating stations, gas pipelines and electricity network infrastructure. These include relevant environmental matters, such as noise and vibration, landscape and visual impacts, air quality, water quality, soil and geology, transport, and biodiversity.

National Planning Policy Framework and Planning Practice Guidance

4.10 The National Planning Policy Framework ('NPPF') [7] was first published in March 2012 and revised on 24 July 2018. The policies contained within the NPPF are expanded upon and supported by the 'Planning Practice Guidance' [8], which was published in March 2014 and is updated regularly.

4.11 The NPPF sets out the Government's planning policies for England and how these are to be applied. It is a material consideration in planning decisions. Paragraph 3 of the NPPF makes it clear that the document does not contain specific policies for NSIPs and that applications in relation to NSIPs are to be determined in accordance with the decision making framework set out in the Planning Act 2008 and relevant NPSs, as well as any other matters that are considered both important and relevant. However, paragraph 5 goes on to confirm that matters that can be considered to be both important and relevant to NSIPs may include the NPPF and the policies within it.

4.12 The revised NPPF maintains sustainable development at the core of its guidelines. Policies set in paragraphs 7–217, taken as a whole, constitute the Government's view of what sustainable development in England means in practice for the planning system. Paragraph 7 sets out that *"At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs".*

4.13 The NPPF focuses its interpretation of sustainable development into three overarching objectives: economic, social and environmental. These are explained

as being interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives).

4.14 Paragraph 148 states that "*the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure*."

4.15 Policies of particular relevance to the scope of the EIA include building a strong and competitive economy; supporting a prosperous rural economy; promoting sustainable transport; requiring good design; promoting healthy communities; conserving and enhancing the natural and historic environment; and meeting the challenge of climate change and mitigating its effects.

Other Matters That May Be 'Important and Relevant'

4.16 In making decisions on applications for NSIPs, Section 104 of the Planning Act 2008 as amended also states that the Secretary of State must also have regard to any other matters that they consider to be both 'important and relevant' to their decision. Paragraph 4.1.5 of EN-1 provides some clarification on the other matters that the Secretary of State may consider both important and relevant. It confirms that these may include development plan documents or other documents in the local development framework.

4.17 EN-1 is clear (reflecting the terms of the Planning Act 2008), however, that in the event of a conflict between these and any other documents and a NPS, the latter prevails for the purposes of Secretary of State decision-making given the national significance of the infrastructure concerned.

Local Planning Policy

4.18 The application site lies entirely within the administrative area of Thurrock District Council. The local development plan for the area currently comprises the following documents:

- Thurrock Core Strategy and Policies for Management of Development ("Core Strategy"), 2011; and
- Borough Local Plan, 1997 – remaining saved policies.

4.19 The Thurrock Core Strategy and Development Management Policies DPD was originally adopted on 21 December 2011 and subsequently updated on 28 January 2015, following an independent examination of the Core Strategy Focused Review document that concentrated on consistency with the NPPF.

4.20 As with the NPPF, these documents will play an important role as they are likely to be considered 'important and relevant' to the Secretary of State's decision under section 104(2)(d) of the Planning Act 2008.

4.21 The Core Strategy highlights the town of Tilbury as a Key Strategic Economic Hub in Strategic Objective SO3 and policy CSSP2 – Sustainable Economic Growth. Core sectors in the growth hub are identified as the Port; logistics and transport; and construction, with growth sectors being business services; environmental technologies; recycling; and energy.

4.22 Of particular relevance to the proposed development is Policy CSSP4: Sustainable Green Belt, which states that:

"The Council will:

I. Maintain the permanence of the boundaries of the Green Belt, excepting the proposed Urban Extension Broad Locations Identified in this policy, Policy CSSP 1 and as shown on the Proposals Map.

II. Resist development where there would be any danger of coalescence.

III. Maximise opportunities for increased public access, leisure and biodiversity.

All without prejudice to and pending:

IV. The formal Review of the Thurrock Core Strategy DPD that the Council will commence in 2011 In accordance with the requirements of the proposed Localism Act and the proposed National Planning Policy Framework"

4.23 The entire application site is located within the Thurrock Green Belt.

4.24 Core Strategy Policy CSTP26: Renewable or Low Carbon Energy Generation is also of relevance, as the purpose of the proposed development – while not a renewable or low-carbon generator itself – is to provide services to National Grid necessary due to the ongoing deployment of intermittent renewable generation sources. The policy states that the Council will actively encourage the development of low carbon energy generation schemes:

''The Council will promote the delivery of district energy networks in appropriate locations, in order to increase the proportion of energy delivered from renewable and low-carbon sources in the Borough.''

4.25 Other policies that may be of relevance to the proposed development include, but are not limited to, the following:

- CSSP3: Sustainable Infrastructure;
- CSSP5: Sustainable Greengrid;
- CSTP15: Transport in Greater Thurrock;
- CSTP16: National and Regional Transport Networks;
- CSTP18: Green Infrastructure;
- CSTP19: Biodiversity;
- CSTP20: Open Space;
- CSTP24: Heritage Assets and the Historic Environment;
- CSTP25: Addressing Climate Change;
- CSTP27: Management and Reduction of Flood Risk;
- PMD1: Minimising Pollution and Impacts on Amenity;
- PMD4: Historic Environment;
- PMD6: Development in the Green Belt;
- PMD7: Biodiversity, Geological Conservation and Development;

- PMD9: Road Network Hierarchy;
- PMD10: Transport Assessments and Travel Plans;
- PMD15: Flood Risk Assessment; and
- PMD16: Developer Contributions.

4.26 The ES for the proposed development will make reference to these policies where relevant.

Emerging Thurrock Local Plan

4.27 Thurrock Council is preparing a new Borough-wide Local Plan. An Issues and Options consultation was undertaken in October and November 2016 and a further Issues and Options Stage 2 consultation was planned for July 2018. This has, however, been placed on hold while Thurrock Council reviews the recently re-published NPPF. A further Regulation 18 consultation was timetabled within the Local Development Scheme (LDS) for late 2017, with a Submission Draft (Regulation 19) consultation expected to follow a year later. The current Local Development Scheme assumes adoption of the new Local Plan by the end of 2020. However, at this stage the council is in the process of updating its Local Development Scheme so these dates are subject to further confirmation.

5 Need and Alternatives

The Need for the Proposed Development

5.1 The Energy White Paper 'Meeting the Energy Challenge' published in 2007 by the Department for Trade and Industry, which formed the basis of the Energy Act 2008, sets out the Government's plans for tackling climate change by reducing carbon emissions whilst ensuring the availability of secure, clean, affordable energy.

5.2 The White Paper and the NPS EN-1 both emphasise the importance of a diverse mix of energy generating technologies, including renewables, nuclear and fossil fuels, to avoid over-dependence on a single fuel type and thereby ensure security of supply. NPS EN-2 further emphasises that fossil fuel generating stations play a vital role in providing reliable electricity supplies as the UK makes the transition to a low carbon economy.

5.3 A significant amount of guidance relating to the need for new energy infrastructure is provided in EN-1. Part 3 of the document outlines the need for the development of nationally significant energy infrastructure and highlights the vital role to economic prosperity and social well-being from ensuring the UK has secure and affordable energy. Furthermore, producing the energy the UK requires and getting it to where it is needed necessitates a significant amount of infrastructure, both large and small scale.

5.4 Paragraph 3.1.2 states that it is for industry to propose new energy infrastructure and that the Government does not consider it appropriate for planning policy to set targets for or limits on different technologies. Notably, paragraph 3.1.3 stresses that the Secretary of State should assess applications for development consent for the types of infrastructure covered by the energy NPSs *"…on the basis that the Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need…",* i.e. the need as described for each of them in the NPS. Paragraph 3.1.4 continues by stating that the Secretary of State should give substantial weight to the contribution that all projects would make toward satisfying this need when considering applications under the Planning Act 2008.

5.5 As such, the need that exists for new energy infrastructure is not open to debate or interpretation and is clearly confirmed by EN-1. Indeed, as a large number of existing oil, coal and nuclear power stations, including the existing Tilbury coal-fired Power Station, close over the next 5–10 years due in part to the requirements of the Industrial Emissions Directive (IED) [9] and/or as plants reach the end of their operational lives, a change in the current mix of energy will occur. Projections in EN-1 indicate 22 GW of electricity generating capacity will close over this period. This creates a significant need for new major energy infrastructure which would help meet energy security needs by replacing closing electricity generating capacity, while at the same time contributing to the Government's plan for a minimum need of 59 GW new electricity generating capacity by 2025.

5.6 The UK Government has undertaken Energy Market Reform (EMR), which is intended to deliver low carbon energy and reliable supplies that the UK needs, while minimising costs to consumers. The EMR introduces a key mechanism to provide incentives for the investment required in energy infrastructure – the Capacity Market, which provides a regular retainer payment to reliable forms of capacity (both demand and supply side), in return for such capacity being available when needed.

5.7 The reformed electricity market is intended to transform the UK electricity sector to one in which low-carbon generation can compete with conventional, fossil-fuel generation – ensuring a cleaner, more sustainable energy mix. Nevertheless, gas generation is still required to meet demand and it also contributes to the objective of reducing national carbon dioxide (CO_2) emissions as generating electricity from gas is more efficient and of lower carbon intensity than other fossil fuels such as coal, resulting in significantly lower CO_2 emissions per generated MW from gas-fired power stations compared to coal-fired power stations.

5.8 There is a general consensus that the Capacity Market will need to clear at materially higher levels than has been the case historically to provide sufficient investment stimulus to enable deployment of baseload CCGT projects, whereas this is not the case for the proposal by Thurrock Power. The investment required to transform the UK's electricity infrastructure will stimulate the economy, support the growth of UK supply chains and boost the jobs market.

5.9 The UK faces closure of existing generating capacity as older, more polluting, power stations close, while UK electricity demand is projected to grow as heat and transport systems are increasingly electrified. EN-1 stresses the need to replace closing electricity generating capacity as well as increasing capacity in response to a possible doubling of electricity consumption 2050.

5.10 The UK electricity network faces exceptional challenges to meet the government's target of reducing carbon emissions. This will largely be achieved through decommissioning carbon intensive plants and increasing levels of low carbon generation such as wind and solar. The integration of significant renewables and nuclear energy supplies places a considerable demand for additional flexibility and reserve supply to be provided within the energy generation mix. This is particularly important for the delivery of real time responses to meet peak energy demands.

5.11 A report commissioned by the National Infrastructure Commission in February 2016 [10] to support the report on 'Smart Power' states:

"There is significant evidence that operational flexibility will be a key driver for the efficient integration of low-carbon technologies. Flexibility can be provided by different sources. One such source is flexible generation; plants that have low minimum stable generation levels, high ramping rates and increased capability for ancillary service provision."

5.12 On 25 July 2017 BEIS and Ofgem published the Smart System and Flexibility Plan which forms an important part of the Government's Industrial Strategy, the forthcoming Clean Growth Plan, and a core component of Ofgem's future-facing work to enable the energy system transition. In 2016 BEIS and Ofgem sought views through the Call for Evidence and the Smart System and Flexibility Plan shows how the Government and Ofgem propose to deliver a smarter and more flexible energy system.

5.13 The Committee on Climate Change report *Reducing UK emissions 2018 Progress Report to Parliament* was published June 2018 [11]. Box 2.1 emphasises the success of the *"Capacity Market* [in] *delivering high security of supply at lower-than-expected prices."* Peaking plant are specifically identified as being one of the novel solutions delivering this security of supply.

5.14 The National Infrastructure Assessment published by the National Infrastructure Commission (NIC) in July 2018 [12] emphasises the critical importance of a more flexible power system:

"Matching energy supply and demand means the electricity system needs 'flexibility', both within days and across seasons. This can be provided by a combination of flexible supply (energy that can be generated on demand); energy storage; and flexible demand (demand that can be moved to a time of day when there is more supply)."

5.15 The proposed development delivers exactly the type of flexible and decentralised power system sought by the NIC.

5.16 In National Grid's Future Energy Scenarios publication in July 2018 [13] the Director, UK System Operator, states *"Our scenarios highlight some important themes and future developments. For example, gas will remain crucial for both heating and electricity generation in all scenarios for the coming decades*".

5.17 For these reasons, Thurrock Power considers that there is a clear and compelling national need for the development of a new gas-fired electricity generating station and has selected the main development site on which to do so for technical, environmental and commercial reasons.

Alternatives

5.18 This section describes the main alternatives that have been considered at the scoping stage, and the reasons for which the preferred development option that is the subject of this scoping request has been selected.

5.19 Alternatives to the proposed development that have been considered are:

- similar development at alternative sites; and
- alternative technologies, principally open or combined cycle gas turbines.

5.20 A 'no development' alternative would not deliver the additional flexible electricity generation capacity associated with this Nationally Significant Infrastructure Project, one which the NPS EN-1 [3] recognises is urgently needed (see Section 3). A 'no development' alternative has therefore not been considered.

5.21 With regard to alternative designs for the preferred technology option on the chosen site, the design process is ongoing (as set out in Section 3). Environmental assessment of and input to the design as it develops will be part of the iterative EIA process. The ES will summarise the alternative design options that were considered by the developer and reasons for selection of the design that is proposed. Further details are given in Section 6.

Alternative Sites

5.22 This type of development must be located in proximity to a suitable electricity and gas grid connection point in order to:

- avoid the environmental impacts of constructing a new long-distance grid connections (high-voltage overhead line or underground cable and gas pipeline);
- minimise losses of electricity in transmission with associated environmental impacts of generating the power that is wasted; and
- maximise project feasibility, as the availability of a suitable point to which the applicant can provide the connection within land under their ownership greatly reduces the timescale, cost and uncertainty of despatch of power by National Grid.

5.23 A suitable grid connection point in the case of the proposed development, a peaking plant assisting National Grid with electricity grid capacity balancing, is a high-voltage substation with available transmission capacity and connection to the high-voltage transmission grid, ideally close to the point of major consumer demand (to minimise transmission losses).

5.24 The Applicant has considered a number of potential locations through a sequential site search exercise, which will be detailed in the ES.

5.25 The proposed development locality has a long history of use for power generation and the land is in the control of the Applicant. The specific ‘main development site’ within the application boundary has been selected to be as close as possible to the existing Tilbury Substation because this:

- minimises the grid connection distance and hence environmental impacts of the grid connection (i.e. disruption and land-take during construction, visual impact of overhead lines if required, transmission losses); and
- minimises the visual impact and effect on green belt openness by locating the proposed development within the historical and current landscape context of substantial existing electricity generation and transmission infrastructure, rather than extending this further into green belt land.

Alternative Technologies

5.26 The functional requirements of the proposed development, to provide the peaking capacity, frequency management and flexible generation services required by National Grid, are to:

- provide frequent starts and stops for generating electricity quickly, in the order of minutes for several times a day, for peaking capacity;
- start and stop exporting stored electricity quickly, in the order of seconds, for frequency management;
- be flexible in level of output (i.e. can easily be operated at partial load); and
- have capital and operational costs, risks and deliverability that make the project commercially viable.

5.27 With regard to electricity generation, alternatives to the proposed gas engines that have been considered are Open Cycle Gas Turbine (OCGT) and Combined Cycle Gas Turbine (CCGT) generators. Other electricity generation options such as wind or photovoltaic power, nuclear or coal-fired power stations do not offer on-demand generation or any possibility of fast start, respectively, and have been discounted.

5.28 The proposed development will require an Environmental Permit to operate, which is only granted by the Environment Agency (EA) subject to demonstrating that Best Available Technology (BAT) is used. A draft BAT report is provided at Appendix A, which compares the proposed reciprocating gas engines to OCGT and CCGT technology options in detail. This includes consideration of start-up time, energy efficiency, environmental performance (air pollutant and greenhouse gas emissions), capital costs (CAPEX) and operational costs (OPEX). The assessment

concludes that the proposed reciprocating gas engines are BAT for a development of this nature, taking the balance of all these factors into account.

5.29 In summary, reciprocating gas engines achieve better energy efficiency than the alternatives and have a faster response time. Air pollutant emissions performance is better for CCGT and OCGT in continuous operation, but this is not representative of expected operating conditions for the proposed development, involving frequent start-up and shut-down during which the emissions performance of CCGT and OCGT worsens. The modular nature of gas engines and lower CAPEX offers significantly greater flexibility and is attractive form a risk and resilience perspective. Ultimately, neither CCGT nor OCGT technology is able to achieve the response times needed and these are not considered to be viable or environmentally-preferable alternatives.

5.30 With regard to energy storage, the established large-scale alternatives of pumped hydro and compressed air storage require specific conditions to be viable, i.e. land for reservoir and outflow at the top and bottom of a large and steep gradient or a suitable geological formation, respectively. These are not available in the site search area and have not been considered further.

Alternative Cooling Options

5.31 As described in Section 3, the applicant is considering air and river water cooling options for the gas engines. These options would have different parasitic electrical loads, affecting the net efficiency of the flexible generation plant, and different potential for environmental impacts. At present it is expected that both of these alternatives will be assessed in the EIA process. A preferred alternative may be identified at the PEI stage or for the final application for development consent, in which case the PEIR and/or ES will describe the reasons for this choice, including the environmental impacts. Alternatively, the applicant may seek development consent for either option within the project design envelope, in which case the ES will report worst-case impacts assessed for either option.

Alternative Designs

5.32 Alternative designs that are considered by the Applicant will be assessed as part of iterative EIA process. The ES will describe the process that the Applicant has

followed to develop the layout of the proposed development and will summarise reasons for selection of the design that is proposed. The EIA will also assess the various potential access road options that are under consideration and the options for gas pipe route within the proposed connection corridor.

5.33 Further details of the proposed approach to assessment of alternative designs are given in Section 6.

5.34 It is noted at this stage, however, that feasible alternative layout options on the main development site are expected to be quite limited, as it is constrained by existing electricity pylons and overhead lines. National Grid's Asset Protection Unit specifies minimum safety distances from power lines and pylons, leaving a limited envelope within which plant, substation, other electrical equipment and surface runoff attenuation ponds can be positioned. The selection of the final layout will be informed using detailed constraints mapping, baseline surveys, technical feasibility studies and consultation feedback.

6 EIA Process

Introduction

6.1 This section presents an outline of the EIA methodology to be employed for the proposed development. It outlines the methodology for the identification and evaluation of potential likely significant environmental effects and also presents the methodology for the identification and evaluation of potential cumulative and inter-related impacts.

6.2 A systematic evidence-based approach is proposed to evaluate and interpret potential effects on physical, biological and human receptors.

Requirement for Environmental Impact Assessment

6.3 The legislative framework for EIA is set by European Directive 2011/92/EU, as amended by Directive 2014/52/EU (collectively referred to as the EIA Directive).

6.4 The EIA Directive requires an EIA to be completed in support of an application for development consent for certain types of project. For projects of this type in England, the European legislative requirements are transposed into law by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

6.5 The process of identifying whether or not EIA is required for a development is known as screening. Projects of the type listed in Schedule 1 of the Regulations require EIA in all cases. Projects of the type listed in Schedule 2 may require EIA in certain circumstances.

6.6 The proposed development would fall under the following paragraph of Schedule 1 of the EIA Regulations;

2 – (1) Thermal power station and other combustion installations with a heat output of 300 megawatts or more.

6.7 As the development falls within Schedule 1 it is determined as an EIA development and an Environmental Statement (ES) must be submitted with the application.

Information Required

6.8 Although there is no statutory provision as to the form of an ES, it must contain the information specified in Regulation 14(2) of the EIA Regulations, including relevant information specified in Schedule 4.

6.9 In summary, the EIA Regulations require that the ES provides a description of the proposed development with its location, physical characteristics and works, operation, land-take and use of resources, and emissions to the environment.

6.10 A description of "*the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen opinion, including a comparison of the environmental effects*" must be provided. In this case, consideration of development location, scale and technology at the scoping stage has not identified any reasonable alternatives, taking into account the identified need for a development of the nature proposed, as has been detailed in Section 5 and appended supporting documents. The ES will therefore provide a description of the reasonable design alternatives studied by the developer.

6.11 The current environmental baseline and how this may change over time without the development, insofar as that can be predicted "*with reasonable effort on the basis of the availability of environmental information and scientific knowledge*" must be described.

6.12 The ES must report likely significant effects on environmental factors specified in regulation 5(2) due to impacts of the proposed development, which is typically reported in an ES topic by topic for each relevant environmental factor. Details of the assessment methodology must be given, including any limitations and uncertainties, and environmental protection objectives must be considered where applicable. All of the following types of effects, where relevant, must be reported: direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects. In addition to likely significant effects of the proposed development during normal conditions, the ES must also report any further expected significant adverse effects due to its vulnerability to relevant major accidents and/or disasters.

6.13 The ES must describe "*measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment*" and any proposed monitoring of same; this is collectively referred to as 'mitigation measures'.

6.14 A Non-Technical Summary (NTS) of the information in the ES is required, and a reference list of sources used in the assessment must also be provided.

6.15 The following sections outline the overall approach to EIA in order to meet these legal requirements. The information supplied in the ES will provide a clear understanding of the likely significant effects of the project upon the environment.

Structure of the Environmental Statement (ES)

6.16 The ES will be structured logically, organised by environmental factor affected by the proposed development, with a topic-specific chapter devoted to each. For example, an air quality chapter with supporting technical appendices and figures will report the baseline, assessment methodology and consultation, predicted significant effects and environmental protection objectives, and mitigation measures for this topic area. Inter-related and cumulative effects will also be reported for each topic. However, for ease of understanding the overall effects of the development including inter-relationships, the ES will also provide summary tables of significant effects, inter-relationships, cumulative effects and mitigation measures across all topics.

6.17 Introductory chapters to the ES will provide a description of the development and site location, the overall EIA methodology, summary of design alternatives considered by the developer, list of cumulative development schemes assessed and summary of how relevant matters raised in consultation responses (including the Scoping Opinion) have been responded to.

6.18 The ES is expected to be divided into volumes, with the likely structure:

- Volume 1: Non-Technical Summary (capable of being read as a stand-alone document);
- Volume 2: ES chapters;
- Volume 3: ES Appendices; and

- Volume 4: ES Figures.

EIA Methodology

Relevant EIA Guidance

6.19 The EIA process will take into account relevant government or professional institute guidance, including:

- Infrastructure Planning (Environmental Impact Assessment) Regulations 2017;
- Overarching National Policy Statement for Energy (EN-1) [3];
- National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2) [4];
- National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) [5]; and
- National Policy Statement for Electricity Networks Infrastructure (EN-5) [6].
- The Planning Act 2008 (as amended);
- Department for Communities and Local Government (2014) Planning Practice Guidance [8];
- Department of the Environment, Transport and the Regions (DETR), Mitigation Measures in Environmental Statements [14];
- Highways Agency et al. (2008) Design Manual for Roads and Bridges, Volume 11, Section 2, Part 5. HA 205/08 [15];
- Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment [16];
- Institute of Environmental Management and Assessment (2011) The State of Environmental Impact Assessment Practice in the UK. Special Report [17];
- Institute of Environmental Management and Assessment (2015) Environmental Impact Assessment: Guide to Shaping Quality Development [18];

- Institute of Environmental Management and Assessment (2015) Climate Change Resilience and Adaptation [19];
- Institute of Environmental Management and Assessment (2016) Environmental Impact Assessment: Guide to Delivering Quality Development [20];
- Institute of Environmental Management and Assessment (2017) Environmental Impact Assessment: Assessing Greenhouse Gas Emissions and Evaluating their Significance [21]; and
- Institute of Environmental Management and Assessment (2017) Health in Environmental Impact Assessment: A Primer for a Proportional Approach [22].

6.20 Other topic-specific specialist methodologies and good practice guidelines will be drawn on as necessary.

Key Elements of the General Approach

6.21 The assessment of each environmental topic will be reported in a separate chapter of the ES. For each environmental topic, the following will be addressed:

- Methodology and assessment criteria;
- Description of the environmental baseline;
- Identification of likely effects;
- Evaluation and assessment of the significance of identified effects, taking into account any measures designed to reduce or avoid environmental effects which form part of the project and to which the developer is committed; and
- Identification of any further mitigation measures envisaged to avoid, reduce and, if possible, remedy any significant adverse effects (in addition to those measures that form part of the project).

Methodology and Assessment Criteria

6.22 Each topic chapter will provide details of the methodology for baseline data collection and the approach to the assessment of effects, including any limitations or uncertainties. Each identified environmental topic will be considered by a

specialist in that area. The identification and evaluation of effects will take into account relevant topic-specific guidance where available.

6.23 Draft details of the proposed approach for each topic, based on information available at this stage, are provided in Section 8 of this Scoping Report.

Description of the Environmental Baseline

6.24 The existing and likely future environmental conditions in the absence of the project are known as 'baseline conditions'. Each topic based chapter will include a description of the current (baseline) environmental conditions. The baseline conditions at the site and within the study area form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions.

6.25 The baseline for the assessment of environmental effects will primarily be drawn from existing conditions during the main period of the EIA work. Consideration will also be given to any likely changes between the time of survey and the future baseline for the construction and operation of the project. In some cases, these changes may include the construction or operation of other planned developments in the area. Where such developments are built and operational at the time of writing and data collection, these will be considered to form part of the baseline environment. Where sufficient and robust information is available, such as expected traffic growth figures, other future developments will be considered as part of the future baseline conditions. In all other cases, planned future developments will be considered within the assessment of cumulative effects.

6.26 The consideration of future baseline conditions will also take into account the likely effects of climate change, as far as these are known at the time of writing. This will be based on information available from the UK Climate Projections project (UKCP09 or updates replacing it), which provides information on plausible changes in climate for the UK [23] and on published documents such as the UK Climate Change Risk Assessment 2017 [24].

Assessment of Design Alternatives

6.27 The development of project design is part of an iterative EIA process. The final design will be developed throughout the EIA process in response to the findings of

initial assessments. The ES will summarise the design iterations, providing a description of the main changes and the associated changes to potential environmental effects. The design will be influenced by the environmental constraints identified during the early stages of the EIA process. Mitigation measures designed to reduce or prevent significant environmental effects will feed into the design layout of the proposed development.

Assessment of Effects

6.28 The proposed development has the potential to create a range of impacts and effects with regard to the physical, biological and human environment. The EIA Regulations require the identification of the likely significant environmental effects of the project. Each topic chapter will take into account both the sensitivity of receptors affected and the magnitude of the likely impact in determining the significance of the effect.

Sensitivity or Importance of Receptors

6.29 Receptors are defined as the physical resource or user group that would be affected by a proposed development. The baseline studies will identify potential environmental receptors for each topic and will evaluate their sensitivity to the proposed development. The sensitivity or importance of a receptor may depend, for example, on its condition (e.g. status with regard to environmental protection objectives), extent of occurrence (e.g. at an international, national, regional or local level) or context of use by humans (e.g. residential, recreational, employment).

Magnitude of Impact

6.30 Impacts are defined as the physical changes to the environment attributable to the project. For each topic, the likely environmental impacts will be identified. The magnitude of the impact will be described using defined criteria within each topic chapter.

6.31 The categorisation of the impact magnitude may take into account the following four factors:

- extent;
- duration;

- frequency; and
- reversibility.

6.32 Impacts will be defined as either adverse or beneficial. Depending on discipline, they may also be described as:

- direct – arising from activities of the development itself, often either spatially or temporally concurrent; or
- indirect – consequential or associated impacts at one remove from the development, often produced away from the project site or as a result of a complex pathway.

6.33 Impacts will be divided into those occurring during the construction phase and those occurring during operation. Where appropriate, some chapters may refer to these as temporary and permanent impacts.

Significance of Effects

6.34 Effect is the term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by considering the magnitude of the impact and sensitivity of the receptor or resource together.

6.35 The magnitude of an impact does not directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.

6.36 Levels of significance that will be used in the assessment will be, in descending order:

- substantial;
- major;
- moderate;
- minor; or
- negligible or no change.

6.37 In order to ensure consistency insofar as possible, a matrix approach will be adopted for the EIA, although there may be instances where topic-specific assessments use an alternative approach, which will be explained in the topic chapter if so. An example of such an EIA matrix is given below in Table 6.1.

Table 6.1: Typical assessment matrix

Sensitivity of Receptor	Magnitude of Impact				
	No change	**Negligible**	**Low**	**Medium**	**High**
Negligible	No Change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No Change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No Change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No Change	Minor	Minor or Moderate	Moderate or Major	Major or Substantial
Very high	No Change	Minor	Moderate or Major	Major or Substantial	Substantial

6.38 Where an effect is described as 'no change' or ‘negligible’, this means that there is either no effect or that the significance of any effect is considered to be below the levels of detection or within natural variation. All other levels of significance will apply to both adverse and beneficial effects. These significance levels will be defined separately for each topic within the methodology sections. In all cases, the judgement made as to significance will be that of the author of the relevant chapter with reference to appropriate standards/guidelines where relevant, based on the following scale as guidance.

- Substantial: only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process with regard to planning consent. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer the most damaging impact and loss of resource integrity, or with impacts on human health and wellbeing affecting national or regional health priorities;

- Major: these beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process;
- Moderate: these beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision making if they lead to an increase in the overall adverse effect on a particular resource or receptor;
- Minor: these beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project; and
- Negligible: no effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Mitigation Measures

6.39 The EIA Regulations require at 14(c) that where significant effects are identified, *"a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment"* should be included in the ES.

6.40 The development of mitigation measures is part of an iterative EIA process. Therefore, measures will be developed throughout the EIA process in response to the findings of initial assessments. The development that forms the subject of the planning application will include a range of measures designed to reduce or prevent significant adverse environmental effects arising, where practicable. In some cases, these measures may result in enhancement of environmental conditions. The assessment of effects will therefore take into account all measures that form part of the development and to which the Applicant is committed.

6.41 The topic chapters will therefore take into account all measures that form part of the proposed development, including:

- measures included as part of the project design (sometimes referred to as primary mitigation);
- measures to be adopted during construction to avoid and minimise environmental effects, such as pollution control measures; and

- measures required as a result of legislative requirements.

6.42 Where required, further mitigation measures will be identified within topic chapters. These are measures that could further prevent, reduce and, where possible, offset any significant residual adverse effects on the environment.

6.43 In some cases, monitoring measures may be appropriate and will be set out in the ES; for example, to ensure that proposed planting becomes established.

Summary Tables

6.44 Summary tables will be used to summarise the effects of the project for each environmental topic.

Cumulative Effects Assessment (CEA)

6.45 This section describes the proposed approach to the Cumulative Effects Assessment (CEA) for the proposed development. Cumulative impacts are defined as those that result from incremental changes caused by other reasonably foreseeable actions or other major developments alongside the proposed development. Cumulative effects are therefore the combined effect of the assessed development in combination with the effects from a number of different projects, on the same single receptor/resource. A fundamental requirement of undertaking the CEA is to identify those foreseeable developments or activities with which the proposed development may interact to produce a cumulative impact. Interactions have the potential to arise during the construction, operation and maintenance, and decommissioning phases.

6.46 PINS Advice Note Seventeen: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects [25] recommends that, through consultation with local authorities and other relevant consenting bodies, other major developments in the area should be taken into account when conducting CEA, including those which are:

- under construction;
- permitted application(s), but not yet implemented;
- submitted application(s) not yet determined;

- projects on the National Infrastructure Planning Portal's Programme of Projects;
- projects identified in relevant development plans; and
- projects identified in other plans and programmes as may be relevant.

6.47 The CEA process is therefore divided into a screening stage and an assessment stage.

Screening Stage

6.48 In order to provide a comprehensive CEA of all relevant projects, a list of developments which have the potential to contribute towards cumulative effects will be drawn up. This is referred to as the long list.

6.49 A defined process will be used to methodically and transparently screen the large number of project and plans that may be considered cumulatively alongside the proposed development and create a shortlist to take forward for assessment. This involves a stepwise process that considers the level of detail available for projects/plans, as well as the potential for interactions to occur, taking into account the following points.

6.50 Conceptual overlap:- for this to occur it must be established that such an impact has the potential to directly or indirectly affect the receptor(s) in question. In EIA terms this is described as an impact–receptor pathway and is defined here as a conceptual overlap.

6.51 Physical overlap:- the ability for impacts arising from the proposed development to overlap with those from other projects/plans on a receptor basis. This means that, in most examples, an overlap of the physical extents of the impacts arising from the two (or more) projects/plans must be established for a cumulative impact to arise. Exceptions to this exist for certain mobile receptors that may move between, and be subject to, two or more separate physical extents of impact from two or more projects.

6.52 Temporal overlap:- in order for a cumulative impact to arise from two or more projects, a temporal overlap of impacts or of effects that persist beyond the duration of impact arising from each must be established. It should be noted that some

impacts are active only during certain phases of development, such as piling noise during construction. In these cases it is important to establish the extent to which an overlap may occur between the specific phase of the proposed development and other projects/plans.

Assessment Stage

6.53 Once a relevant cumulative project has been taken forward to the assessment stage, a tiered approach is proposed for the CEA. The tiered approach provides a framework to assist the decision maker in placing relative weight upon the potential for each project to ultimately be realised, based upon the project's current stage of maturity. The allocation of projects into tiers is not affected by the screening process but is merely a categorisation applied to all projects that have been screened in to the assessment. The tiered approach uses the following categories.

6.54 **Tier 1** comprises other project/plans that are:

- currently under construction; those consented but not yet implemented;
- submitted but not yet determined;
- currently operational that were not operational when baseline data was collected; and/or
- operational but have an on-going impact that is not included in baseline data and has potential for likely significant cumulative effects.

6.55 **Tier 2** adds projects likely to come forward but have not yet submitted an application for consent (the PINS programme of projects is the most relevant source of information). Specifically, this tier includes all projects where the developer has submitted a Scoping Report.

6.56 **Tier 3** adds projects/plans where the developer has advised PINS in writing that they intend to submit an application in the future but have not submitted a Scoping Report.

6.57 The tiered approach is consistent with PINS Advice Note Seventeen [25]. All projects/plans that have been screened into the CEA via the screening process will be allocated into one of the above tiers and assessed for cumulative impact.

Major Known Cumulative Developments

6.58 Based on an initial review, the major Tier 1 and 2 major developments in the immediate area of the proposed development with potential for cumulative effects are as follows. This list will be further developed for the EIA following the methodology set out above, including searches for non-NSIP major developments with potential for significant cumulative impacts, and minor developments that may introduce relevant new sensitive receptors.

- The construction of a new port terminal on the north bank of the River Thames ('Tilbury2') by Port of Tilbury London Limited (POTLL).
- The construction of a further crossing of the river Thames (the "Lower Thames Crossing" or "LTC") and associated new roads to the M25 and to Tilbury Port.
- The completion and operation of Tilbury Green Power Station (within Tilbury Port)[5].
- The demolition of the remainder of Tilbury B Power Station by RWE (if works are not expected to be complete prior to construction of the proposed development).
- Construction and operation of a 2.5 GW CCGT, 300 MW OCGT and battery storage facility on the Tilbury Power Station site by RWE.
- London Distribution Park and the operation of the Amazon Distribution and Fulfilment Centre to the west and Thames Enterprise Park (redevelopment of the 'Coryton' site) to the east.
- The ongoing Goshen Farm land-raising operation to the east on land formerly used for ash disposal and landfill.

6.59 A possible residential development south and west of East Tilbury is being promoted at the early issues and options stage of the emerging Local Plan. If this development comes forward in the planning system during the EIA process, cumulative impacts will be considered if applicable.

[5] although it is understood that this is at the commissioning stage and its presence may therefore form part of the existing baseline for some topic areas

6.60 The Lower Thames Crossing, Tilbury2 and RWE project application boundaries overlap with some land that is identified within the proposed development's application boundary for potential access roads, gas pipeline and potential cooling pipe routes, and they immediately adjoin the proposed development in other areas of its boundary. This is illustrated in Figure 16.

6.61 The Applicant has worked closely with Highways England, RWE and Port of Tilbury to consider cumulative effects and mitigation requirements or opportunities (such as landscaping and biodiversity enhancement) afforded by some or all of these developments in conjunction and will continue to do so during the EIA process.

Transboundary Effects

6.62 Transboundary effects arise when impacts from the development within one European Economic Area (EEA) state affects the environment of another EEA state(s). The need to consider such transboundary effects has been embodied by the United Nations Economic Commission for Europe Convention on EIA in a Transboundary Context (commonly referred to as the 'Espoo Convention'). The Convention required that assessments are extended across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary impacts.

6.63 Due to the location and nature of the proposed development there is no potential for transboundary impacts would occur, and therefore the need for an assessment of transboundary effects is proposed to be scoped out of the EIA process.

7 Summary of Proposed EIA Scope

7.1 Table 7.1 lists the environmental topic areas proposed to be scoped in to the EIA process due to potential for significant environmental effects. As discussed in Sections 5 and 6, the ES would also include a description of the proposed development, summary of design alternatives studied and reasons for selection of the design, and summary tables of inter-related effects, cumulative effects, mitigation and monitoring, and significant residual effects.

7.2 Table 7.2 summarises topic areas or specific impacts proposed to be scoped out. Further detail on the reasoning in each case is given in the following Sections 8 and 9, respectively.

Table 7.1: Matters scoped in

Landscape and visual resources
Archaeology and cultural heritage including marine archaeology where applicable
Traffic and transport
Land use, agriculture and socio-economics
Air quality
Onshore ecology
Aquatic environment
Habitats Regulations Assessment report
Noise and vibration
Water resources and flood risk, including WFD impacts
Geology, hydrogeology and land contamination
Climate change (greenhouse gas emissions)

Table 7.2: Matters scoped out

Environmental topic or impact	**Reason**
Transboundary effects	No potential for transboundary impacts

Environmental topic or impact	Reason
Alternative sites and technologies	Sequential site search, need for development of this type (supported by national policy) and assessment of Best Available Technology have shown that proposed site and technology are the best option. (However, alternative designs and cooling options will be assessed iteratively in the EIA process and the environmental benefits or dis-benefits compared to the proposed design will be summarised.)
Operational traffic impacts	Operational traffic would be minimal, as the proposed development will not require a full-time on-site workforce
Impact of operational traffic noise	Operational traffic would be minimal, and have negligible potential for noise impact
Operational vibration	Vibration attenuates very rapidly through the ground within a few metres and it is considered most unlikely that the operation of plant will cause any vibration impacts at sensitive receptors.
White clawed crayfish *Austropotamobius pallipes* survey	There are no known records of this species in the area, and it is reasonable to assume that the species is absent given its proximity to the tidal influence and salinity of the Thames Estuary.
Bat survey	There are no potential roost sites in the main development site, and the development is considered highly unlikely to result in fragmentation of foraging or commuting routes given the habitats present on the site.
Otter	No Otters are recorded within 2 km of the main development site boundary and the loss of any ditches on site is not considered to have a detrimental impact on foraging Otters.
Biocide assessment	Historically biocide has not been used at the nearby Tilbury Power Station nor is understood to be intended for the RWE Tilbury Energy Centre. As a result, the use of biocide is not expected to be necessary for the proposed development and will not be considered as part of the Thurrock Flexible Generation Plant application.
Fish impingement	Passive wedge wire cylinder screening will prevent fish from entering the intake cooling pipe
Saltmarsh	Area of development lies to the east, outside of the saltmarsh and with no potential to impact upon it.

Environmental topic or impact	Reason
Use of existing / consented jetty	The existing or consented new jetty for the land raising operation will be used. There will be no refurbishment of the jetty or dredging of the seabed adjacent to the jetty required for the proposed development. The limited and temporary intensification of jetty use (relative to the multi-year existing and future use of the jetty for large deliveries of material for land-raising) is not considered to have any potential for significant aquatic environment impacts.
Climate change (vulnerability/adaptation of development)	Aside from changes in rainfall and flood risk (to be assessed in Water Resources and Flood Risk chapter), the other predicted changes in temperatures, humidity and wind speed are not of a sufficient magnitude to require any specific design response for resilience or to impact on the proposed development's operation
Environmental effect of vulnerability to major accidents or disasters (as a separate ES chapter)	Risks due to flooding will be assessed in Water Resources and Flood Risk chapter. No other likely significant environmental effects arising from vulnerability of the proposed development to major accidents or disasters is predicted, as the proposed development is not expected to be a COMAH site or involve storage of significant quantities of potentially polluting substances.
Human health (as a separate ES chapter)	Potential for impacts on human health via environmental pathways including air pollutant or noise emissions, ground or water contamination will be assessed to environmental standards set to be protective of health in the respective ES topic chapters. No significant impacts on human health are considered likely and a separate EIA chapter is proposed to be scoped out.
Waste management	No demolition is required and proposed development would mainly comprise pre-engineered, modular components. Significant construction or decommissioning waste arisings are unlikely; waste would be managed through measures in a CoCP and CEMP and equivalent for decommissioning at the time. Operational waste would be minimal as the proposed development would have no waste-generating processes and no full-time workforce.

Environmental topic or impact	Reason
Material assets and natural resources	No existing infrastructure or assets apart from Common Land and agricultural land would be significantly affected. Agricultural and Common Land impacts will be assessed in the Land Use ES chapter. The principal resource consumed in operation would be natural gas, with impacts of its consumption on climate change assessed in the Climate Change chapter.
Radiation, heat and light	The proposed development would not be a source of ionising radiation or public exposure to non-ionising radiation. There is no potential for likely significant environmental effects due to heat, aside from potential cooling water discharge which will be assessed in the Aquatic Environment chapter. Potential impacts of any security lighting on ecology will be assessed in that topic chapter.
Aviation	No potential for likely significant effects given distance to airports and presence of other taller structures nearby.
Combined Heat and Power (CHP)	The proposed development is inherently unsuited to CHP due to its intermittent, peaking operation, so no development of CHP is proposed or considered feasible and no assessment of environmental impacts of the development of CHP infrastructure is required.
Carbon Capture Readiness (CCR) and Carbon Capture & Storage (CCS)	Land-take required for CCR will be assessed. Details of specific CCS development within the CCR land cannot be established with sufficient certainty for EIA, and such a development, if sought in the future, would be subject to development control and EIA if required at the time. Assessment of CCS is therefore not proposed.

8 Identification of Potentially Significant Environmental Impacts

8.1 The following sections discuss environmental impacts with potential for likely significant effects that are proposed to be considered in the EIA. The draft methodology and assessment criteria are outlined for each topic area. Where possible at this scoping stage, potential mitigation measures that may be considered following assessment are also discussed.

Landscape and Visual Resources

Baseline Conditions

8.2 The main development site comprises two virtually flat agricultural fields, which lie below 5 m AOD. The boundaries are defined by large drainage ditches. There are few trees on the site confined to the boundary ditches. The site is bisected by 400 kV and 275 kV overhead transmission lines (OHLs), for which four supporting towers lie within the main development site. The site and the surrounding land lie in an area known as West Tilbury Marshes.

8.3 To the north of the main development site, a railway line runs south-west to north-east between Tilbury and Stanford-le-Hope. It crosses a flat farmland landscape, comprising both arable and pasture land. Rough pasture, divided by numerous ditches, with scrub and a few areas of more mature trees lie between the main development site and the railway. The farmland to the north beyond the railway is crossed by five to six OHLs of differing voltages. A ridgeline, rising to approximately 25 m AOD at Gun Hill, runs west to east approximately 600 m to the north of the main development site. The village of west Tilbury and hamlet of Low Street, as well as a number of individual farmsteads are located along the ridgeline. Beyond the slope of the ridgeline are the small town of Chadwell St. Mary (north-west) and large village of East Tilbury (north-east).

8.4 The landscape to the east is a mix of arable farmland and pasture that make up East Tilbury Marshes. There are also large areas of disturbed land, coal storage areas associated with Tilbury Power Station and areas used to accommodate material arising from the London Gateway project. Coalhouse Fort, on the bend

of the River Thames between the Gravesend Reach and The Lower Hope stretch of the river, lies approximately 2.5 km to the east of the main development site.

8.5 Immediately south of the main development site is a National Grid electricity substation. Tilbury Power Station site lies further south, where a jetty stretches out onto the River Thames, on the Gravesend Reach. The electricity generation and transmission infrastructure to the south is a visually dominant feature of the area, although elements of Tilbury Power Station are presently being demolished. On the opposite side of the river (south bank) lie Milton, Denton and Chalk, suburbs of Gravesend. Milton, on the banks of the Thames is largely commercial/industrial, with some residential properties, Denton, further inland, is largely residential. Chalk, on the outskirts of Gravesend, is a residential area surrounded on three sides by farmland. To the south-south-east, within Gravesend itself, the land rises up from the Thames to 59 m AOD at Windmill Hill. Further south, at Shorne, lie the wooded slopes of the Kent Downs Area of Outstanding Natural Beauty (AONB).

8.6 Tilbury Sewage Treatment Works is located to the west of and adjacent to Tilbury Power Station and south-west of the main development site. Further west lies an area of Access Land, divided by Fort Road, which is used as common grazing land. To the south of the Access Land, on the banks of the Thames is Tilbury Fort, and beyond the fort, Tilbury Docks. To the north of the railway line lies the town of Tilbury. Further west still, beyond Tilbury Marshes, lies the town of Grays.

8.7 The site lies within National Character Area profile 81 – ‘The Greater Thames Estuary’ (NE473); South Essex Coast Landscape Character Area ‘Tilbury, Mucking and Fobbing Marshes’; and Local Character Area ‘Tilbury Marshes’. ‘Tilbury and Docks Urban Areas’ lies to the west while the ‘Chadwell Escarpment’ lies 800 m to the north. These character areas are shown in Figures 7 and 8.

8.8 No part of the proposed development lies within a nationally or locally designated landscape. The closest nationally designated landscape is the Kent Downs AONB, which lies approximately 6 km to the south-east of main development site.

8.9 The main development site is not crossed or bordered by public footpaths or highways but part of the site and a few other fields in the surrounding landscape are registered Common Land and by default Access Land. The southern section of the main development site is known as Walton Common.

Approach and Scope of the Assessment

8.10 The methodology draws upon the following established best practice guidance, including:

- Guidelines for Landscape and Visual Impact Assessment, Third Edition [26] (GLVIA3);
- Landscape Character Assessment: Guidance for England and Scotland [27]:
- An Approach to Landscape Character Assessment [28];
- Landscape Institute Technical Information Note 08/15: Landscape Character Assessment [29];
- Landscape Institute Advice Note 01/11: Photography and photomontage in landscape and visual impact assessment [30].
- Landscape Institute Technical Guidance Note 02/17: Visual Representation of Development Proposals [31]; and
- Landscape Institute Technical Guidance Note: Photography and Photomontage in Landscape and Visual Impact Assessment (Public Consultation Draft) [32].

8.11 The LVIA will set out the landscape planning context of the proposed development, with reference to the European Landscape Convention, relevant sections of National Policy Statements, the National Planning Policy Framework, county and district policies, including saved policies, as well as relevant supplementary guidance.

8.12 A detailed study of the existing landscape components, character and views of the application site within a 10 km buffer from the site boundary of the main development site. A 1 km buffer along the linear and/or buried elements of the proposed development, namely, those elements within application site areas C,

D, E, H, I and K is proposed. Within the identified study areas the following will be described as part of the baseline studies:

- site context;
- topography and drainage;
- land use and vegetation, including green infrastructure;
- public rights of way, including promoted paths and Access Land;
- communications, e.g. roads, railways and the River Thames;
- settlement;
- landscape character, including a review of published landscape character assessments;
- landscape designations and factors that contribute to local landscape value; and
- visual resources and views, including representative views.

8.13 The LVIA will include a brief description of the project, with any proposed landscape and visual mitigation.

8.14 As part of the LVIA an assessment of the sensitivity of the receiving landscape will be undertaken. This is combination of the susceptibility of the existing landscape character to the proposed change and the value of the landscape receptor. The magnitude of the proposed impact (change) on landscape character, elements and features will be analysed, this will be assessed by identifying the size/scale of the proposed change, the geographical extent over which the change will be experienced and the duration and reversibility of the effects.

8.15 Separately, the assessment of effects on views will be similarly analysed. The sensitivity of the receptor (person) will be established by assessing the sensitivity of the visual receptor type to the proposed change and the value attached to a particular view. The magnitude of impact will be assessed by identifying the size/scale of the change, its geographical extent and the duration and reversibility of the visual impact.

8.16 The significance of the effects of the proposed development at Year 1 and Year 10, on both landscape character and visual receptors will be considered using a combination of the sensitivity of the resource/receptor to the proposed development and the magnitude of the impact. The consideration of effects will include an assessment of night time effects.

8.17 Cumulative effects of projects types identified in Section 6 of this Scoping Report, on landscape character and visual receptors will be assessed. Cumulative effects on landscape character include physical effects on the landscape elements or effects on the value attributed to that landscape. Cumulative visual effects will include combined visibility and sequential views.

8.18 The assessment will be supported by site visits and photographs from viewpoints agreed with Thurrock District Council and, if required, Natural England (in respect of the Kent Downs AONB). The representative views will have been identified using the initial Zone of Theoretical Visibility (ZTV) shown in Figure 9 for the tallest elements of the proposed development, the (up to) 40 m high stacks. The ZTV has been generated using a bare ground Digital Terrain Model (DTM) and the Environment Agency's LiDAR Digital Surface Model (DSM). Where LiDAR data is not available, buildings and areas of woodlands have been given a set height. The ZTV will be reviewed in the field in order to agree the initial selection of representative views which form the basis of the visual assessment:

8.19 Twenty potential viewpoint locations are shown on Figure 9 and listed below. The exact location of representative views and photomontages will be agreed in consultation with Thurrock Council.

1. Footpath FP33 at the south-west corner of The Park
2. Footpath FP47 by the side of the railway
3. Footpath FP45 at the south east corner of Orsett Golf Club, next to Walnut Tree Cottages
4. Footpath junction FP60/FP61 next to East Tilbury
5. A126 between Tilbury and Chadwell St Mary
6. Footpath FP68 at Gun Hill, West Tilbury
7. Footpath FP200 near Buckland

8. Coalhouse Fort
9. Cliffe Fort
10. Bridge over the railway track on the west edge of Tilbury
11. Tilbury Fort
12. Corner of Thames Estuary Path near Wharves
13. Where Thames Estuary Path reaches the coast
14. Footpath junction NS138 behind Shorne Marshes Nature Reserve
15. Gravesend Town Pier
16. Footpath junction NS138/NS318 along Saxon Shore Way
17. Darenth Wood Road
18. Windmill Hill
19. At the junction of footpath NS170 joins road and Brummelhill Wood
20. Footpath DR143 at edge of settlement near New Barn

8.20 Up to five accurate Visual Representations of the proposed development for agreed representative views (visual receptors) will be produced with reference to the guidance within the Landscape Institute Advice Note 01/11: Photography and photomontage in landscape and visual impact assessment [30], Technical Guidance Note 02/17: Visual Representation of Development Proposals [31] and Technical Guidance Note: Photography and Photomontage in Landscape and Visual Impact Assessment (Public Consultation Draft) [32].

8.21 Mitigation measures will be considered as part of the iterative design process.

Summary of Matters Proposed to be Scoped Out

8.22 None proposed.

Archaeology and Cultural Heritage

Baseline Conditions

8.23 The site lies within a culturally rich area with numerous heritage assets, the most important of which relate to the strategic importance of the River Thames and its

function as the maritime approach into London. Their setting has been affected by 20th Century developments such as Tilbury Power Station, flood defences, Tilbury Docks, residential and industrial development. Key known heritage assets include the following, which are shown in Figure 10.

Scheduled Monuments

- Tilbury Fort
- Earthworks near church, West Tilbury
- Second World War anti-aircraft battery at Bowaters Farm
- East Tilbury Battery
- Coalhouse Fort battery and artillery defences

Listed structures

- Officers Barracks at Tilbury Fort – Grade II*
- Worlds End Inn – Grade II
- Riverside Station, including floating landing stage – Grade II*
- Biggin Farmhouse – Grade II
- Gunhill Farmhouse – Grade II
- West Tilbury Hall and barn – Grade II
- Church of St James – Grade II*
- Walnut Tree Cottage – Grade II
- Polwicks – Grade II
- Buckland – Grade II
- Old Rectory – Grade II
- Church of St Katherine – Grade I

8.24 There are no World Heritage Sites, Scheduled Monuments, Registered Parks and Gardens, Conservation Areas, Historic Battlefields, or Listed Buildings identified within the application boundary.

8.25 A geophysical survey has been carried out on main development site by Wessex Archaeology between 21st August and 25th August 2017. The survey report is provided at Appendix B. The detailed gradiometer survey detected a small number of anomalies, perhaps of archaeological interest, which are largely confined to the southern part of the survey area. These anomalies are linear,

rectilinear and curvilinear in form, and could be indicative of anti-glider ditches as well as associated infrastructure dating from WWII.

8.26 Many of the anomalies have been identified as being of possible archaeological interest due to their form in plan, although the limited evidence from archaeological investigations and finds in the surrounding area makes their interpretation less conclusive; many of the responses could conceivably be of either natural or anthropogenic origins. Any future intrusive investigation, such as archaeological trial trenches, would seek to provide direct information on the archaeological nature, or otherwise, of these anomalies and a dynamic review of the geophysical interpretation during this phase of investigation may provide a greater understanding of the surrounding anomalies of uncertain provenance.

Approach and Scope of the Assessment

8.27 The scope of the assessment will be to determine physical impacts and/or impacts on the setting of non-designated heritage assets, including historic landscape character areas, within the application site. It will determine impacts on the setting of designated and non-designated heritage assets, including historic landscape character areas, in a defined study area around the application site.

8.28 A desk-based archaeological assessment will determine, as far as is reasonably possible from existing records and visits to relevant archives and local libraries, the nature of the archaeological resource within a site centred study area with a radius of 1 km for non-designated assets. A larger study area of 5 km radius will be used to identify designated heritage assets. The provisional study area is shown in Figure 11. An inventory of all heritage assets will be cross-referenced to drawings (base maps). This baseline collation of data will be supported by site visits to identify any unknown archaeological assets, the potential for survival of archaeology and to establish the setting of identified archaeological assets.

8.29 Due to the scale of the proposed development, there is the potential for effects on the setting of designated and non-designated heritage assets. The Zone of Theoretical Visibility (ZTV) (to be determined as part of the landscape and visual impact assessment, as discussed in the section above) will be used as a tool of assessment to identify areas of visibility; however, as the setting of a heritage

asset is not a solely visual concept, other aspects such as aural intrusion and historical associations will be taken into account as appropriate.

8.30 If the once-through water cooling option is pursued, a marine archaeology assessment including specialist assessment of marine geophysics may be required and this will be explored further through consultation.

8.31 The assessment will follow current professional good practice and guidance including that produced by the Chartered Institute for Archaeologists (CIfA) and Historic England (HE) (formerly English Heritage (EH)), namely:

- CIfA (2014) – Standard and Guidance for Historic Environment Desk-Based Assessment [33];
- CIfA (2014) – Code of Conduct [34];
- EH (2008) – Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment [35];
- HE (2015) – Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment [36];
- HE (2017) – Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (second edition) [37]; and
- HE (2015) – Historic England Advice Note 4: Tall Buildings [38].

8.32 The impact assessment will consider potential effects of the proposed development upon the significance of the heritage resource and seek to understand the level of harm, if any, to that significance.

8.33 Once all of the potential heritage receptors have been identified, they will each be assigned a ‘value’. This will take into account not only their designated or non-designated status but also other factors including artistic, archaeological, architectural or historic values. The impact from the proposed development upon the significance of the heritage assets will then be determined and expressed within the EIA. This will allow judgement of the initial significance of effect of the proposed development upon the heritage resource, taking into account any embedded mitigation, having regard to the activity that has taken place in the area and its industrial setting.

8.34 The assessment criteria used to determine the magnitude of impact and sensitivity of receptor are set out in Table 8.1 and Table 8.2. The significance of effect will then be determined using a matrix based on that given in Section 6.

Table 8.1: Magnitude of change criteria for historic environment receptors

Magnitude of impact	Description of impact
High	Total or substantial loss of the significance of a heritage asset. These effects are likely to be important considerations at a district/borough level or greater.
Medium	Partial loss or alteration of the significance of a heritage asset. These effects, if adverse, while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource
Low	Slight loss of the significance of a heritage asset. This can include the removal of fabric that forms part of the heritage asset, but that is not integral to its significance (e.g. the demolition of later extensions/additions of little intrinsic value). Level of harm perceivable, but insubstantial relative to the overall interest of the heritage asset. These effects may be raised as local issues but are unlikely to be of importance in the decision-making process.
Negligible	A very slight change to a heritage asset. This can include a change to a part of a heritage asset that does not materially contribute to its significance.

8.35 The sensitivity of the heritage asset will depend on factors such as the condition of the asset and its perceived heritage value and significance. These are defined in terms of national, regional or local statutory or non-statutory protection and grading of the asset, set out in Table 8.2.

Table 8.2: Sensitivity criteria for historic environment receptors

Sensitivity	Criteria
High	World Heritage Sites Scheduled Monuments & Areas of Archaeological Importance Archaeological sites of schedulable quality & significance
Medium	Undesignated sites of demonstrable regional importance

Sensitivity	Criteria
Low	Sites with significance to local interest groups Sites of which the significance is limited by poor preservation and poor survival of contextual associations

8.36 It is acknowledged that these sensitivity criteria primarily deal with visual factors affecting setting. While the importance of visual elements of settings, e.g. views, intervisibility and prominence, are clear, it is also acknowledged that there are other, non-visual factors which could potentially result in setting effects. Such factors could be other sensory factors, e.g. noise or smell, or could be associative. In coming to a conclusion about magnitude of change in setting, the assessment will make reference to traffic, noise, air quality, and landscape and visual assessments, undertaken for the EIA, as appropriate.

8.37 'Negligible' sensitivity is not used for heritage assets, as this would equate to a feature/building with no heritage significance. In such a circumstance, such a feature/building would not be regarded as a heritage asset.

8.38 The sensitivity of the receiving environment, together with the magnitude of change, defines the significance of the impact. 'Substantial', 'major' or 'moderate' effects in relation to the historic environment are considered to be significant. The effects could be adverse or beneficial.

8.39 Following the initial assessment of significant effects, any further mitigation required will be considered and recommendations made. The significance of residual effects remaining after mitigation will be assessed according to accepted criteria for assessing heritage assets (as detailed in the references above).

Summary of Matters Proposed to be Scoped Out

8.40 None proposed.

Traffic and Transport

Baseline Conditions

8.41 The main development site can be accessed from an existing private access (farm track) off Station Road, which via various other roads has connections with the A1089 in the west, A13 to the north and the M25 to the west.

8.42 The London to Southend Victoria railway line runs to the north of the site.

8.43 There are a number of PRoWs to the north of the railway that provide connections to the main community of Tilbury and the smaller communities of East and West Tilbury. There are also connections to the River Thames coast path to the south.

Approach and Scope of the Assessment

8.44 The following potential impacts may be associated with the proposed development:

- generation of traffic during construction (and decommissioning) affecting the local and strategic road network;
- impacts on highways and road users due to construction vehicle access and abnormal loads, in particular for transformer delivery;
- generation of traffic during operation affecting the local and strategic road network.

8.45 Department for Transport Guidance on Transport Assessment [39], which was recently withdrawn but does not have a replacement, indicated that developments generating significant movement should be assessed as part of a Transport Assessment. For this kind of development, the guidance suggested a threshold of 30 two-way vehicle movements per hour for when a Transport Assessment would be required. Further guidance in the NPPF and PPG indicates that a Transport Assessment should be prepared for development proposals that generate ‘significant movement’, which is consistent with the advice in the former Guidance on Transport Assessment.

8.46 The principal vehicle movements are anticipated to be associated with the construction phase (including commissioning) of the development. It is likely that

during some phases of construction, the rate of vehicle movements will be above the guidance threshold for Transport Assessment.

8.47 During the operational phase of the proposed development, there will be occasional maintenance vehicle visits and occasional staff visits, but no significant full-time workforce will be required. It is considered very unlikely that operational traffic would be above the guidance threshold for Transport Assessment and it is proposed to scope out an assessment of operational traffic impacts, subject to confirming that operational traffic flows would be well below the indicative threshold for assessment and are predicted to have a negligible potential for adverse effects.

8.48 To fully address the impacts of the construction phase on the transport network, it is expected that a Transport Assessment (TA) will be produced, subject to confirmation following determination of the number of construction movements and in liaison with Thurrock Council and Highways England. Consultation may also be required with Essex County Council as the neighbouring local highway authority. The scope for the TA will follow the guidelines set out in the Department of Communities and Local Government's 'Planning Practice Guidance' document (March 2014) [40].

8.49 The traffic and transport chapter in the ES will assess the magnitude of impacts and significance of effects, drawing from the analysis in the TA, using criteria contained in the 'Guidelines for the Environmental Assessment of Road Traffic' document, produced by the Institute of Environmental Management & Assessment [41]. The ES chapter will report residual and cumulative effects should proposed mitigation (see below) not fully address the impact of the development on the transport network.

8.50 The scope of the TA will cover the following key areas:

- a review of national, regional and local transport policy including the National Planning Policy Framework [7] and the Thurrock Local Transport Plan [42];
- a description of baseline and future baseline conditions, including link and junction flows (described further below), a review of highway safety issues including examination of personal injury accident data and consideration of accessibility by all main transport modes;

- calculation of construction traffic flows over the period of construction;
- distribution and assignment of construction traffic flows to the road network, including the identification of routes for abnormal loads such as the delivery of generators and transformers;
- local network impact analysis – the size of the study area is to be confirmed with the local authorities and Highways England, and key junctions may be identified by these stakeholders that require detailed capacity analysis;
- consideration of the local public rights of way for leisure and commuting uses, and whether their use would be affected by the proposed development; and
- formulation of mitigation measures, such as a Construction Worker Travel Plan to promote sustainable journeys during the construction phase of the development and where possible reduce single occupant car journeys, and a Construction Traffic Management Plan to seek to control the routing and impact that HGVs will have on the local road network during construction.

8.51 Cumulative effects will be assessed as set out in Section 6, including in particular the potential changes in the highway network with the Lower Thames Crossing.

8.52 An initial review of the road network in the vicinity of the site suggests junction counts will be required at the A1089/ Dock Road roundabout and the A13 Orsett Cock Roundabout. These will be supplemented by link counts on the local access roads including Fort Road, Coopers Shaw Road, Station Road and Brentwood Road. It is likely that additional traffic surveys may need to be undertaken to supplement the count locations identified above, though this will be determined in liaison with the authorities. The data will also form the basis of calculations to quantify the impact of construction traffic on the surrounding road network.

Summary of Matters Proposed to be Scoped Out

8.53 Assessment of operational traffic generation, as this will be negligible.

Land Use, Agriculture and Socio-Economics

Baseline Conditions

8.54 The main development site, north of the National Grid substation at Tilbury, comprises farm land which is predominantly Agricultural Land Classification

(ALC) Grade 3 (Good to Moderate). The southern area of the main development site is known as Walton Common (registered common land number CL228). It forms part of the common known as The Green, Hall Hill, Fort Road, Parsonage, Walton and Tilbury Fort Commons (ID 33611).

8.55 Preliminary consultation has been undertaken with the Open Spaces Society and Natural England, the statutory consultees, to discuss works on the common land and to identify a suitable area of land to the north of the railway as exchange land. This land would link to the other areas of common forming The Green, Hall Hill, Fort Road, Parsonage, Walton and Tilbury Fort Commons and be of comparable size and quality to the land to be released i.e. it would be similarly advantageous to the interests of the landowners, commoners and the public. The process for providing exchange land would be undertaken under Section 131 of the Planning Act 2008.

8.56 There are no other existing land uses on the site, other than the existing pylons and power lines. No public rights of way cross the site or link to it and the nearest major residential area is Tilbury, approximately 800 metres to the west.

Approach and Scope of the Assessment

8.57 The assessment would consider the following potential effects arising from the proposed development:

- the permanent loss of agricultural land and the effects on the farm holding;
- the permanent loss of registered common land and measures to be taken to provide replacement land of similar quantity and quality; and
- the generation of employment opportunities during the construction, operation and decommissioning phases of the development.

8.58 Any temporary and permanent impacts of the amenity of local residents and other sensitive receptors as a result of the construction activities and operation/decommissioning of the project will be assessed in the Traffic and Transport, Noise and Vibration, Air Quality, Landscape and Visual Amenity and Heritage assessments as required.

8.59 Data sources used in the desk based study to identify baseline conditions would include:

- Ordnance Survey mapping;
- Register of Common Land, Town and Village Green;
- MAGIC at magic.gov.uk [43];
- *1 inch to 1 mile ALC Sheet of the East Region and accompanying Reports;*
- Soil Survey of England and Wales datasets;
- Census 2011 [44];
- NOMIS Labour Market Profiles [45].

8.60 The methodology for assessing land use, agriculture and socio-economic impacts will take into account the following advice/guidance:

- 'The Green Book: Appraisal and Evaluation in Central Government', HM Treasury 2003 [46];
- Design Manual for Roads and Bridges (DMRB) Section 11.3.6 ‘Land Use‘ [47]; and
- DMRB Section 11.3.8 ‘Pedestrians, Cyclists, Equestrians and Community Effects’ [48].

8.61 There is currently very little Government guidance setting out the preferred method for, or content of, an assessment of potential socio-economic effects and there are no standard criteria for assessing the significance of effects on socio-economic receptors. Therefore, account will be taken of the guidance set out in the DMRB, which, although developed for highways projects, is also useful for other forms of development. A proportionate approach will be taken in assessing socio-economic effects, as these are likely to be small, arising mainly from the construction stage as the proposed development would not require a full-time operational workforce.

8.62 The land use, agriculture and socio-economic assessment would comprise the following:

- a review of relevant policy and guidance;
- a desk top baseline study to identify of land use, agriculture and socio-economic resources existing on the development site and within a defined study area;

- a site visit to verify the nature and quality of existing land use and agricultural resources, farming activities and undertake a soil and ALC survey;
- an assessment of the likely construction, operational, decommissioning and cumulative effects on those resources.

Summary of Matters Proposed to be Scoped Out

8.63 Detailed assessment of socio-economic impacts of employment generation, as this will be largely limited to the temporary construction workforce.

Air Quality

Baseline Conditions

8.64 A number of Air Quality Management Areas (AQMAs) have been designated in the surrounding area. The nearest AQMA, designated by Thurrock Borough Council (TBC), is located approximately 1.8 km west of the site and encompasses Tilbury Dock Road, Calcutta Road and part of St Chads Road, Tilbury. The AQMA has been designated due to high levels of nitrogen dioxide (NO_2) attributable to road traffic emissions.

8.65 To the south of the site, Gravesham Borough Council (GBC) has designated seven AQMAs. The nearest AQMAs designated by GBC are approximately 2.5 km from the site and cover the Northfleet industrial area and the A226 one-way system. The Northfleet industrial area has been designated due to high levels of particulate matter with a mean aerodynamic diameter of less than 10 microns (PM_{10}) attributable to fugitive emission sources. The A226 one-way system AQMA has been designated due to high levels of NO_2 attributable to road traffic emissions.

8.66 Existing ambient air quality at the site will be characterised by drawing on information from the following public sources:

- Defra maps [49], which show estimated pollutant concentrations across the UK in 1 km grid squares; and
- published results of local authority Review and Assessment (R&A) studies of air quality, including local monitoring and modelling studies.

8.67 In addition, baseline NO_2 concentrations have been measured at five locations around the application site by passive diffusion tubes between December 2017 and June 2018. The results are presented in Appendix G and will be used to inform the characterisation of ambient NO_2 concentrations in the area and to indicate current NO_2 concentrations at the nearest sensitive receptors.

8.68 Table 8.3 compares the results of the diffusion tube monitoring study to local authority NO_2 monitoring at the nearest monitoring location to the site and the Defra mapped NO_2 concentration estimate at the site.

Table 8.3: Ambient annual-mean (long-term) NO_2 concentrations

Source of data	Site type	Approx. Distance to Site	NO_2 ($\mu g.m^3$)
Diffusion tube monitoring study	Monitored	1 – 1.4 km	18 – 26.4
Nearest local authority monitoring location (Tilbury, Calcutta Road)	Monitored	1.8 km west of proposed development	37.1 (5 year average 2010-2014)
Defra Mapped Concentration (2015)	Estimated	-	13.3

8.69 The existing air quality concentrations at designated habitat sites and the existing acid and nutrient nitrogen deposition rates will be obtained from the UK Air Pollution Information System (APIS) [50] for the relevant sensitive habitats.

Approach and Scope of the Assessment

8.70 The proposed development has the potential to give rise to changes in air quality at sensitive receptors in the vicinity of the site through dust emissions associated with site preparation, construction and decommissioning work, and through emissions from the exhaust stacks once the gas engines are operational.

8.71 For the construction phase of the proposed development the key pollutant is dust, covering both PM_{10} that is suspended in the air that can be breathed, and

the deposited dust that has fallen out of the air onto surfaces and which can potentially cause temporary annoyance effects. The main development site is relatively insensitive in this regard, with no dwellings in close proximity and significant separation distances to ecologically sensitive sites. Construction of the access road(s) and excavation of the gas pipeline trench and potential cooling water trench would be closer to dwellings, but construction work in any one section of these linear features is likely to be for a short duration.

8.72 Dust can be readily controlled using good practice during the construction phase. A dust impact risk assessment will be undertaken using the IAQM *'Guidance on the assessment of dust from demolition and construction'* [51]. Mitigation measures consistent with the level of risk will be recommended for incorporation in a dust management plan. These will be drawn from the IAQM guidance referenced above, and it is considered that residual dust effects with the implementation of recommended mitigation would not be significant.

8.73 Air pollutant emissions from construction traffic will be assessed if traffic flows are predicted to exceed the indicative thresholds for assessment set out in Environmental Protection UK (EPUK)/IAQM (January 2017) *Land-Use Planning & Development Control: Planning For Air Quality* [53] or are otherwise considered to have potential for significant effects, although at present it is expected that construction traffic flows are likely to be below the indicative thresholds.

8.74 For the operational phase of the proposed development, the main pollutant from the exhaust stacks is nitrogen oxides (NO_x). Emissions of total NO_x from combustion sources comprise nitric oxide (NO) and NO_2. The NO oxidises in the atmosphere to form NO_2. The UK Air Quality Strategy sets objectives for NO_2 and the assessment of operational impacts therefore focuses on changes in NO_2 concentrations.

8.75 The impacts of NO_x emissions from the exhaust stacks will be evaluated using the ADMS 5 dispersion model, a version of the ADMS (Atmospheric Dispersion Modelling System) developed by Cambridge Environmental Research Consultants (CERC). The dispersion modelling will take account of terrain, local

building and meteorology effects. Five years of hourly sequential meteorological data collated at Gravesend will be used within the model.

8.76 A stack height assessment will be undertaken to establish an appropriate height to overcome building turbulence and achieve good dispersion in the atmosphere.

8.77 Annual-mean NO_2 concentrations will be modelled for a grid of receptors, centred on the exhaust stack location, and at selected sensitive human-health receptors.

8.78 Concentrations of nitrogen oxides will be modelled for a grid of receptors including statutorily designated habitat sites within 10 km of the proposed development in accordance with EA guidance [52].

8.79 Cumulative impacts will be assessed as set out in Section 6. With regard to operational air pollutant impacts, these would be assessed semi-quantitatively for the following sources using information available at the time of the EIA.

8.80 Cumulative impacts of developments with significant point-source emissions (e.g. RWE's 2.5 GW CCGT and 300 MW OCGT proposal and Tilbury Green Power Station):- if relevant information is available in environmental impact reporting, the ambient concentration used within the modelling for the proposed development will be increased. Otherwise, the point source will be included within the proposed development model using a suitable set of emissions data, based on other representative modelling studies. Where appropriate, the relative operating times will be considered in the cumulative assessment.

8.81 Cumulative developments with significant traffic-related emissions (e.g. the Lower Thames Crossing or Tilbury2):- a proportionate approach to assessing the cumulative effects is proposed. If predicted air pollutant impacts are available in environmental impact reporting, the ambient concentration used within the modelling for the proposed development will be increased by the average increase stated in available environmental impact reporting for the cumulative development(s). Otherwise, if traffic generation data is available, the maximum NO_2 concentration at receptors closest to these roads will be estimated and compared with the impact from the proposed development at the same receptors.

8.82 The significance of the illustrated effects of the combustion of the gas will be described using professional judgement and relevant criteria, including those set

out in the Environmental Protection UK (EPUK)/IAQM (January 2017) *Land-Use Planning & Development Control: Planning For Air Quality* document [53] and the EA's online risk assessment guidance [52].

8.83 The proposed development will be operated in accordance with BAT under an environmental permit. No additional mitigation measures are likely to be required, unless any air quality standards are exceeded.

Summary of Matters Proposed to be Scoped Out

8.84 Operational traffic air pollutant emissions, as traffic generation in operation would be negligible. Potentially, construction traffic air pollutant emissions if construction traffic is predicted to be below assessment thresholds in guidance and no significant effects are expected.

Onshore Ecology

Baseline Conditions

8.85 There are several Sites of Special Scientific Interest (SSSIs) within 5 km of the main development site, the closest being Mucking Flats and Marshes SSSI around 2.6 km to the east (on the north bank of the Thames) and South Thames Estuary and Marshes SSSI around 2.8 km to the south and east (on the south bank of the Thames). Both of these SSSIs are component parts of the Thames Estuary and Marshes Special Protection Area (SPA). Other nearby sites are Hangmans wood and Deneholes SSSI located approx. 4 km to the northwest and Globe Pitt, again approx. 4 km to the north west.

8.86 There are two local wildlife sites within 1 km of the main development site. The first of these is known as Lytag Brownfield Site and it sits approx. 200 m to the west, with important assemblages of invertebrates. Survey works undertaken on the site have also shown there to be a good population of common reptiles present, including slow worm, common lizard, adder and grass snake. The second is known as The Tilbury Centre, located approx. 500 m southwest of the main development site. It is designated for a complex mosaic of grassland, flower-rich early successional/pioneer vegetation, ditches, a small reedbed and a pond, notable for its colony of Stonewort *Chara sp.* and the nationally rare (Red Data Book) Great Silver Beetle *Hydrophilus piceus*. The pioneer vegetation

includes abundant Bird's-foot Trefoil Lotus corniculatus, on which the national BAP bumblebees *Bombus humilis* forages. Other important invertebrates have also been recorded here.

8.87 These features are shown in Figures 12, 13 and 14.

8.88 An Extended Phase I Habitat survey of the main development site and extending north as far as the railway line was undertaken in February 2017. This is reported at Appendix C. The Phase 1 survey was updated in April to June 2018 to include additional areas within the proposed application boundary and this updated survey is reported at Appendix D.

8.89 The main development site is dominated by arable (16.2 ha within the survey boundary) and a semi-improved grassland field (11.2 ha), with a long ditch system and scattered scrub, trees and tall ruderal vegetation. Hardstanding is found along the northern boundary and separates the main line railway from the arable and grassland. These habitats are known to support common reptiles and nesting birds, and may be of value to foraging and commuting bats. In addition, a badger sign was found around the ditch system, although no setts were located on or off site, suggesting it is used for foraging and commuting purposes.

8.90 Within the main development site, the area of highest ecological interest was found to be associated with the semi-improved grassland, ditch system and scrub, which provides shelter, foraging and commuting for common reptiles, nesting birds and invertebrates. Common reptile surveys undertaken in 2017 and 2018 have found all four common species of reptile present, i.e. slow worm, common lizard, grass snake and adder.

8.91 As part of the Extended Phase I Habitat survey, waterbodies in or within 250 m of the main development site were surveyed using a Habitat Suitability Index to establish their potential to support great crested newt populations. Subsequently, two waterbodies were tested using the eDNA method. Both lie within 250 m of the site, with the ditch surrounding the arable and improved fields and the man-made pond to the west, approx. 100 m from the boundary. These tests did not return positive results for great crested newt DNA.

8.92 An additional waterbody located north of the railway line was subject to an eDNA survey in June 2018. The eDNA test returned a negative result, and it is therefore currently assumed that GCN are not present on or near to the application site.

8.93 Additional surveys carried out in 2018 included breeding bird surveys and water vole surveys. Water vole signs were found in ditches on the boundaries of and within the main development site.

Approach and Scope of the Assessment

8.94 The following potential impacts may be associated with the proposed development:

- permanent loss of habitats within the main development site and where access road(s) are constructed, and associated impacts on species;
- disturbance of ecological receptors (e.g. by noise, dust or light impacts) in the vicinity of the development during construction or operation;
- temporary impacts on habitats during construction of the gas pipeline and potentially cooling pipeline;
- temporary and permanent impacts on aquatic habitats and water quality in the ditch and pond networks;
- air quality impacts on ecological receptors during operation; and
- aquatic impacts associated with the potential cooling water system, from elevated water temperature in the cooling water outlet and from fish entrainment, which are discussed further in the following Aquatic Environment section.

8.95 Potential impacts on ecological receptors will be assessed using the Chartered Institute of Ecology and Environmental Management (CIEEM) Ecological Impact Assessment Guidelines [54]. Any likely significant adverse effects will be mitigated or compensated for and ecological enhancements will also be recommended where appropriate. Any likely significant residual effects on ecological receptors following the implementation of mitigation and compensation will be identified.

8.96 Additional ecological surveys that have been or will be undertaken, to facilitate an adequate assessment of the likely effects of the proposed development on designated sites and protected/notable species, are listed in Table 8.4 below. Table 8.5 also lists surveys that are proposed to be scoped out, on the basis of baseline survey work and consultation with Natural England to date (see Appendix F).

Table 8.4. Ecological surveys proposed

Survey	Scope/ Methodology	Timing
Desk Study	All habitats within application boundary. Two km radius for protected species records and locally designated sites; 5 km radius for nationally designated sites (SSSIs); and 10 km radius for internationally designated sites (SPA, SAC, Ramsar and Marine Conservation Zones (MCZ)).	February 2017 to May 2018
Preliminary ecological appraisal (PEA) survey	All habitats within application boundary.	February 2017 to May 2018
Botanical survey	Additional walkover survey of main development site and land within application boundary identified for potential common land replacement, to provide further information on plant communities present.	June 2018
Invertebrates	Initial walkover survey of main development site to assess potential for it to support invertebrate assemblage of conservation interest.	May 2018
Great Crested Newt (GCN)	HSI of all ponds within and (where there is habitat connectivity and access is possible) 250 m of the main development site, gas connection and access road(s) and other permanent or temporary structures with potential to impact GCN.	May 2017
GCN eDNA	eDNA surveys of all ponds identified as potentially suitable for GCN following HSI	May 2017
Reptiles	Presence / absence surveys of suitable reptile habitat potentially affected by temporary or permanent construction within application boundary	April – May 2018
Breeding birds	Territory mapping survey of land within application boundary	April – May 2018

Badgers	Surveys of main development site and all land within application boundary where temporary or permanent construction has potential to affect badgers, to update previous Badger survey	April – July 2018
Water Vole	Presence / absence survey of ditches and watercourses	April – May 2018
Wintering and passage birds – cooling water intake/outfall	Two surveys per month, one at low and one at high tide, to map the distribution of birds in the area potentially affected construction of cooling water intake/outfall, if proposed.	August 2018 – March 2019

Table 8.5. Ecological surveys scoped out

Survey	Reason to scope out
Wintering and passage birds – other areas of development	There is negligible potential for the arable farmland crossed by the gas connection and access road route corridors to support important assemblages of wintering and passage birds, including qualifying species of the Thames Estuary internationally designated site.
White clawed crayfish *Austropotamobius pallipes*	There are no known records of this species in the area, and it is reasonable to assume that the species is absent given its proximity to the tidal influence and salinity of the Thames Estuary.
Bats	There are no potential roost sites in the main development site, and the development is considered highly unlikely to result in fragmentation of foraging or commuting routes given the habitats present on the site and the design of the development which minimises loss of boundary features.
Otter	No Otters are recorded within 2 km of the main development site boundary and the loss of any ditches on site is not considered to have a detrimental impact on foraging Otters.

8.97 Where possible, the proposed development will be designed to avoid potential impacts on protected species. This will include retaining or designing habitat areas within the main development site and along the access, gas and potential cooling water connection routes, as well as establishing a potential translocation area for reptiles.

8.98 The results of the surveys, the desk study, consultation responses and the Extended Phase 1 Habitat survey will be used to undertake an ecological impact assessment. Once the ecological baseline has been fully described, any

ecological receptors that are likely to be significantly impacted by the proposed development will be identified and appropriate and proportionate mitigation will be described where necessary. Mitigation and enhancement proposals will consider wider strategic aims and options for mitigation of development in the Tilbury area and the cumulative developments around the application site.

Habitats Regulations Assessment

8.99 The Thames Estuary and Marshes SPA and Ramsar site lies approximately 2.6 km east of the main development site. Component SSSIs of the SPA / Ramsar site are Mucking Flats and Marshes SSSI and South Thames Estuary and Marshes SSSI. A study to inform a Habitats Regulations Assessment will be undertaken, comprising a screening assessment of potential Likely Significant Effects (LSEs) and, where LSEs are identified, a study to inform an Appropriate Assessment (AA) of these LSEs on European Sites will be produced.

8.100 Following the recent People for Wind court judgment[6] on the validity of using mitigation measures to screen out impacts on European Sites, a full Appropriate Assessment is required for all LSEs where mitigation measures are intended to avoid or minimise the potential for LSEs to occur.

8.101 Therefore it is anticipated that the following LSEs may or will be considered beyond the screening stage into full AA:

- Surface water impacts including pollution incidents during construction if a hydrological connection between the construction site and the SPA occurs. The implementation of standard environmental control measures during construction, to be defined through a CoCP and CEMP, will minimise the risk of a pollution event to the River Thames. Implementation of control measures during operation, including appropriate drainage design and management of materials storage regulated by the development's Environmental Permit, would avoid water quality impacts that are likely to result in significant effects on the designated site.
- Potential disturbance effects on intertidal birds from the construction of the cooling water intake and outfall system. The applicant may avoid this LSE by

[6] Case C 323/17 Court of Justice of the European Union

timing works to occur outside the migratory or wintering period or may, if seeking consent for this cooling option, do so at a later stage outside the DCO process following the programme of wintering and passage bird surveys to inform the assessment of impacts, as discussed in Section 3.

- Potential effects from aerial emissions, primarily NO_x and nitrogen deposition. An assessment of emissions on designated features will be undertaken in accordance with standard guidance, and in accordance with recent legal precedent guidance from Natural England [55] on assessing air quality effects of projects both alone and in-combination.
- Potential effects from the release of warm water from the cooling system on aquatic and intertidal ecosystems within the SPA / Ramsar (see further detail in Aquatic Environment section, below).
- Potential effects from the entrainment or other mortality / morbidity on fish populations and hence on prey populations or ecosystem food webs in the SPA (see further detail in Aquatic Environment section, below).

8.102 A Habitats Regulations Assessment Report will be completed for consultation with Natural England. The relevant matrices from PINS Advice Note 10: Habitats Regulations Assessment [56] will also be completed.

Summary of Matters Proposed to be Scoped Out

8.103 See Table 8.5, above.

Aquatic Environment

Baseline Conditions

8.104 In 2011 the Thames estuary was put forward as a recommended Marine Conservation Zone (rMCZ) and has now been split into two zones: the Upper Thames Estuary rMCZ has been put forward primarily for the protection of European smelt (*Osmerus eperlanus*) which migrate along the estuary; and the Lower Thames Estuary rMCZ for the protection of tentacled lagoon worms (*Alkmaria romijni*). Currently these proposals are at draft status with specific features to be protected by each rMCZ pending on public consultation.

8.105 The Thames estuary is highly influenced by strong tides and fresh water, creating a wide range of habitats supporting a variety of birds (wildfowl and waders), aquatic invertebrates, fish (including freshwater, estuarine, diadromous (migrating species between freshwater and salt water) and marine adventitious (occurring by chance) species), higher plants and macroalgae. It also acts as a nursery and is used by dianadromous species seasonally for migration and spawning.

8.106 Previous reports have found the Thames estuary to support a variety of bird species, including black-tailed godwits (*Limosa limosa*) at the Holehaven Creek and avocets (*Recurvirostra* spp.) at the Mucking flats [57]. The only notable aquatic invertebrate species found was the marine reed-building species of polychaete worm *Sabellaria spinulosa*, but distribution is limited to marine environments. *Sabellaria spinulosa* has been found in high abundance in the outer estuary around the Kentish, but due to *Sabellaria spinulosa's* physiology (can only live in salt water) is therefore of no concern to the Thurrock Flexible Generation Plant [58].

8.107 Over 125 species have been recorded with notable fish species including herring (*Clupea* spp,), sprat (*Sprattus* spp.), thornback ray (*Raja clavate*), dover sole (*Solea solea*), seabass (*Serranidae spp.*) and sea lamprey (*Petromyzon marinus*) to name a few. Of total marine mammal sightings, the proportions have been bottlenose dolphin (*Tursiops* spp.) (8% of total), harbour porpoise (*Phocoena phocoena*) (26%), common seal (*Phoca vitulina*) (21%), grey seal (*Halichoerus grypus*) (15%), unidentified seal species (25%) and other (5%) [59].

8.108 Information on the baseline environment is available through several studies in the Thames Estuary: surveys undertaken by the Environmental Agency under the National Marine Monitoring Programme (NMMP), Water Framework Directive (WFD), Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Thames Estuary Dredging Association (TEDA); as well as other published and as yet unpublished reports. Aquatic ecology surveys are being undertaken for the RWE Tilbury Energy Centre development [60] (since May 2017), to support the DCO application. Specific studies initiated by RWE include benthic, plankton, fish, saltmarsh and water quality surveys, as well as thermal and fish entrainment modelling. If this information is publicly available within a timeframe that can

inform the Thurrock Flexible Generation Plant EIA and provides suitable information then there is the potential that the need to collect additional aquatic baseline data (as set out below) will be reduced.

8.109 Proposed aquatic environment baseline surveys, should the applicant take forward the option of once-through water cooling, as listed below in Table 8.6. In addition, as was described in the onshore ecology section above, if the construction of the direct water cooling intake pipe occurs outside the wintering period (August – March) then an updated survey will be required to confirm the usage of the intertidal area by bird species.

Approach and Scope of the Assessment

8.110 The following potential impacts may be associated with the proposed development if once-through water cooling is developed:

- permanent loss of habitats due to the installation of the cooling water intake and outfall pipe;
- disturbance of aquatic ecological receptors in the vicinity of the development during construction including:
    - direct effects such as underwater noise and lighting on fish, bird and aquatic mammal species,
    - benthic habitat loss (permanent and temporary),
    - sediment disturbance and effects on prey species and indirect effects on fish, birds and aquatic mammal species);
    - displacement/removal of seabed sediments along with associated sediment suspension and resettlement;
    - release of chemicals/ heavy metals from disturbed seabed sediment;
    - changes to the hydrodynamics from the installation of both temporary and permanent structures;
- aquatic impacts associated with the operational phase:
    - elevated water temperature in the cooling water outlet; and
    - fish entrainment and impingement during the intake of cooling water.

8.111 The aquatic ecology chapter will assess impact of the construction and operation phases of the proposed development on the Upper and Lower Thames Estuary rMCZ and the potential for both European smelt and tentacled lagoon worms to be present in areas significantly affected. The approach to the assessment will include consultation with the Marine Management Organisation (MMO), Natural England, Environmental Agency and Port of London Authority.

8.112 An assessment of cumulative impacts with the RWE Tilbury Energy Centre development's once-through cooling proposal will be undertaken.

8.113 The Chartered Institute of Ecology and Environmental Management (CIEEM) Ecological Impact Assessment Guidelines [61] will be used to assess any potential short and long-term impacts. Any significant impacts will be mitigated or compensated for where possible and ecological enhancements may also be recommended where appropriate. Measures may include the use of a passive wedge wire cylinder screening system in the cooling water intake to reduce the potential impacts of entrainment and impingement, possible seasonal restrictions for construction to reduce impacts to wintering birds and removing the use of biocide from the project.

8.114 Other surveys that may be required, subject to the availability of data from the RWE Tilbury Energy Centre EIA, may include localised water quality sampling, intertidal core and subtidal grab samples, plankton and fish trawls. It is possible that historical data will provide sufficient baseline information on plankton without need for further survey, and this may be scoped out upon further review of available data and in further consultation with the parties identified above.

8.115 These surveys would be undertaken in the spring/summer months, with quarterly seasonal surveys across the year undertaken for plankton and fish trawls. Any likely significant residual effects on ecological receptors following the implementation of mitigation and compensation will be identified.

8.116 A summary of the aquatic ecological surveys currently proposed to facilitate an adequate assessment of the likely effects of the proposed development are listed in Table 8.6.

Table 8.6: Scope of aquatic surveys

Survey	No. of Surveys	No. of replicates for each survey	Timing
Benthos			
Intertidal benthic sampling (cores)	6	3 for biota, 1 for Particle Size Analysis, small sediment samples for contaminants	August 2018
Subtidal benthic sampling (grabs)	14	3 for biota, 1 for Particle Size Analysis, small sediment samples for contaminants	August 2018
Plankton			
Ichthyoplankton (trawls)	4	12	August 2018, November 2018, February 2019, May 2019
Phytoplankton (water samples)	4	12	August 2018, November 2018, February 2019, May 2019
Zooplankton (trawls)	4	12	August 2018, November 2018, February 2019, May 2019
Fish			
Subtidal fish (trawls)	4	5 (each for beam, otter and pelagic trawl)	August 2018, November 2018, February 2019, May 2019
Intertidal fish (various)	4 (fyke nets)	Double fykes at each survey (sample ebb & flood)	August 2018, November 2018, February 2019, May 2019
	4 (push nets)	1 replicate (push nets)	
	4 (seine nets)	2 replicates (seine nets)	
Water Quality			
Water Quality	4	12	August 2018, November 2018, February 2019, May 2019

8.117 The results of the surveys, the desk study, consultation responses, modelling and a review of available literature sources for the water body will be used to undertake an aquatic ecological impact assessment. Subject to the application programme, the assessment may be progressed based on the initial two quarters of monitoring data in 2018; this approach would be further consulted on with the parties identified above.

8.118 It is likely that thermal plume and fish entrainment modelling will be required to fully assess potential impacts form cooling water intake. Thermal plume modelling and fish entrainment models will be based on cooling water flow data for the proposed development and an identified Zone of Influence.

8.119 The use of chemical treatment / biocides has not been found necessary for biofouling risk management in historical operation of the nearby Tilbury Power Station once-through water cooling and therefore it is not expected to be necessary for the proposed development. This avoids impact on the aquatic environment by chemical emissions, consistent with Best Available Techniques (BAT) set out by the OSPAR Convention [62].

8.120 Recommend use of the passive wedge wire cylinder screening will prevent fish from entering the intake cooling pipe and as a result there would be no impingement of fish species and no assessment of this will be required.

Summary of Matters Proposed to be Scoped Out

Table 8.7: Summary of surveys and assessment to be scoped out

Survey	Reason for scope out
Biocide assessment	Historically biocide has not been used at the nearby Tilbury Power Station nor is understood to be intended for the RWE Tilbury Energy Centre. As a result, the use of biocide is not expected to be necessary for the proposed development and will not be considered as part of the Thurrock Flexible Generation Plant application.
Fish impingement	Passive wedge wire cylinder screening will prevent fish from entering the intake cooling pipe
Saltmarsh	Area of development lies to the east, outside of the saltmarsh and with no potential to impact upon it.

Use of existing / consented jetty	The existing or consented new jetty for the land raising operation will be used. There will be no refurbishment of the jetty or dredging of the seabed adjacent to the jetty required for the proposed development. The limited and temporary intensification of jetty use (relative to the multi-year existing and future use of the jetty for large deliveries of material for land-raising) is not considered to have any potential for significant aquatic environment impacts.

Noise and Vibration

Baseline Conditions

8.121 The proposed development will be located on greenfield land near the existing industrial setting of Tilbury Power Station, Tilbury Port and waste water treatment works to the south and west. The area to the north and east of site is mainly rural, crossed by the London, Tilbury and Southend Railway.

8.122 The closest residential noise sensitive receptors (NSRs) to the main development site are located on Church Road to the north and beyond Fort Road to the west, at a distance of approximately 950 m and 750 m respectively to the main development site boundary.

8.123 Construction activities for access road(s) and the gas connection may be in closer proximity to sensitive receptors, depending on the locations of these works within the route corridors shown on Figure 2.

8.124 Existing baseline conditions have been established through a combination of attended and unattended monitoring at seven locations representative of the nearest receptors to the main development site. Details and results of the monitoring are provided in the 'Baseline Sound Monitoring Report' (ref. JAT10265-BR-01-R00, dated 23 March 2018) at Appendix E.

8.125 The residential NSRs located to the north of the proposed development on Church Road are situated in a predominantly rural area. The existing acoustic environment at these receptors is dominated by sound from road traffic and from trains on the railway to the south.

8.126 Residential NSRs located to the west of the proposed development on Fort Road are situated on the eastern edge of the town of Tilbury, Thurrock. The existing acoustic environment at this location is primarily influenced by sound from road

traffic on Fort Road and the surrounding highway network, and sound from trains on the railway line to the south.

8.127 The nearest non-residential NSRs are located in the Town of Tilbury, over 1 km from the main development site boundary. Tilbury Pioneer Academy School is located to the west of the site at a distance of approximately 1.2 km.

Approach and Scope of the Assessment

8.128 The noise and vibration assessment will be carried out with reference (but not limited) to the following noise policy and guidance, in addition to the national policy statements and NPPF referenced in Section 4:

- Noise Policy Statement for England, 2010 [63];
- Planning Practice Guidance for Noise, 2014 [64];
- British Standard (BS) 5228-1 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 1: Noise' [65];
- International Organisation for Standardisation (ISO) 9613-2: 1996 'Attenuation of sound during propagation outdoors. Part 2: General method of calculation' [66];
- BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound' [67];
- BS 7445: 2003 'Description and Measurement of Environmental Noise' [68];
- Control of Pollution Act 1974; and
- Calculation of Road Traffic Noise (CRTN) [69].

8.129 The following activities associated with the proposed development are considered to have the potential to result in an adverse noise effect at identified NSRs.

8.130 Construction and decommissioning noise:- based on experience of similar sites, it is anticipated that the main source of construction noise associated with the proposed development is likely to be from impact piling, should this be required. Other significant construction noise sources include construction of access roads, stripping of topsoil and ground preparation, and installation of plant items. Decommissioning noise is not considered likely to exceed construction noise,

given that the development would comprise steel-framed structures and items of equipment that can be deconstructed or removed whole, rather than demolished.

8.131 Construction and decommissioning traffic:- traffic flow increase on the local highway network has the potential to temporarily increase road traffic noise levels at NSRs located along associated link roads.

8.132 Operational noise impacts gas engines and associated equipment:- noise generating plant items such as the gas engines, inverters, transformers, air coolers/conditioning units and substations have the potential to result in a noise impact at identified NSRs. Based on experience on similar sites, it is anticipated that cooling plant is likely be the dominant source of sound in the case of air cooling, although there will also be other sources of noise such as exhaust stacks, air intakes, pumps and transformers. Operational noise from the proposed development will be, where practicable, controlled at source by plant selection and engineering noise control measures.

8.133 Road traffic generated during operation would be minimal, as set out in the transport section above, and assessment of operational road traffic noise is proposed to be scoped out of the EIA.

8.134 Based on the distances between the main development site and the nearest residential receptors, significant vibration impacts associated with the construction activity on that site are most unlikely, as levels of vibration attenuate very rapidly through the ground within a few metres. However, the construction of the gas pipeline and access road(s) will be in closer proximity to vibration sensitive receptors (VSRs). As such, if any construction activities with potential to generate significant levels of vibration are proposed, the requirement to provide a quantitative assessment of construction vibration will be reviewed and quantitative assessments undertaken as necessary. It is considered that a requirement to undertake quantitative assessment of construction vibration may arise if any construction activities with significant vibration generation potential are proposed within 100 m of a VSR.

8.135 The main source of operational vibration will likely be from the gas engines. However, given that levels of vibration attenuate very rapidly through the ground within a few metres, it is considered most unlikely that the operation of the plant

will cause any vibration impacts at the nearest VSRs, significant or otherwise. It is therefore proposed to scope out quantitative assessment of operational vibration.

8.136 In addition to the potential noise effects on the identified residential NSRs, construction noise from activities such as piling, if required, also has the potential to adversely affect local wildlife and bird species. Potential for noise impacts on wildlife will be considered and effects on wildlife assessed, if likely to be significant, in conjunction with the ecology assessment.

Proposed Assessment Method

8.137 Baseline noise monitoring requirements were agreed in advance with the Local Planning Authority (detailed in Appendix F). Baseline monitoring was undertaken in accordance with BS 7445:2003 'Description and Measurement of Environmental Noise'. Baseline sound monitoring was carried out in the first half of February at locations representative of identified NSRs. Unattended monitoring was undertaken over a duration of approximately three weeks, supplemented with attended monitoring during the daytime, evening and night-time. Measured data takes account of weather conditions during the survey to obtain a dataset from which representative baseline ambient and background noise levels for the assessment will be derived.

8.138 Noise levels associated with enabling and construction works will be predicted following procedures given in BS 5228:2014. Noise increases at NSRs due to construction traffic on public roads will be calculated in accordance with CRTN. The assessment of construction works will include the electrical, water and gas connections.

8.139 The operational noise impact of the proposed development will be predicted using computer noise modelling software (SoundPLAN or CadnaA), based on information on plant layout, the operating conditions and the levels of noise generated by plant items and vehicles. The model will predict noise levels under light down-wind conditions based on geometric propagation, atmospheric absorption, ground effects, screening and directivity according to the procedure detailed in ISO 9613.

8.140 The significance of the noise effect of the proposed development during operation will be assessed using the method given in BS 4142:2014 and World Health Organisation (WHO) guidance [70]. Following guidance contained within BS 4142:2014, the assessment will take account of the tonal, impulsive and intermittent characteristics of the proposed plant items. The proposed assessment methodology may be amended following consultation with relevant stakeholders.

8.141 The construction and decommissioning phases of the proposed development may have a potentially significant impact on traffic flows on local roads around the site. The change in road traffic noise levels, at relevant NSRs, will be determined in accordance with the calculation procedure contained within CRTN. The predictions will be based on 'base year' and 'with- development' traffic data provided as part of the proposed traffic and transport assessment.

Summary of Matters Proposed to be Scoped Out

8.142 Operational traffic noise, as traffic generation in operation would be negligible. Operational vibration, due to rapid attenuation and distance to sensitive receptors.

Water Resources and Flood Risk

8.143 This section of the Scoping Report identifies the hydrology and flood risk conditions of relevance to the proposed development and considers the likely significant impacts and effects from the construction, operation and maintenance, and decommissioning of the project on hydrology and flood risk receptors.

Baseline Conditions

8.144 The main development site is currently open land adjacent to the existing National Grid Tilbury Substation site.

8.145 The River Thames is located approximately 1 km to south of the main development site. The river is tidally dominant and protected by Environment Agency (EA) flood defences. As part of the TE2100 project the defences are programmed to be upgraded in future.

8.146 Chadwell Cross Sewer (c. 1.2 km) and Pincock Trough (c. 620 m) are to the west of the main development site, with Tilbury Main West (c. 450 m) and Tilbury West Brach Sewer (c. 420 m) located to the east.

8.147 Land in the main development site drains into artificial channels, which outfall into open land drains bordering the site, eventually discharging into the River Thames.

8.148 The EA Flood Map for Planning identifies that the entire application area is located within Flood Zone 3 (see Figures 5 and 6). The definition of Flood Zone 3 according to the National Planning Policy Guidance [8] is:

"Flood Zone 3 is land that has a high probability of flooding (1 in 100 year or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%)."

8.149 The EA Surface Water Flood Risk Map indicates the majority of the main development site is at very low risk of surface water flooding. Localised areas within the application boundary are defined as being at medium to high risk of surface water flooding, associated with isolated low lying areas of land. The definitions of surface water flood risk are as follows.

- Very Low Risk means that each year this area has a chance of flooding of less than 0.1%.
- Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.
- Medium Risk means that each year this area has a chance of flooding of between 1% and 3.3%.
- High Risk means that each year this area has a chance of flooding of greater than 3.3%.

8.150 A 500 m radius from the main development site and relevant works such as access road construction is considered appropriate for data collection, taking into account the nature of the proposed development and likely zone of influence on hydrological receptors, including the Thames.

8.151 An initial desk based review of literature and data sources will be undertaken to support the assessment and will likely include:

- British Geological Survey (BGS) 1:50,000 geological mapping
- BGS Aquifer Designation Maps;
- Environment Agency website (2017);
- Natural England Magic Map (2017) magic.gov.uk;
- The Centre for Ecology and Hydrology (CEH) (2017) (www.ceh.ac.uk);
- Environment Agency (EA) Flood Hazard Mapping;
- EA Thames Estuary 2100 (TE2100) Plan [71];
- Medway Estuary and Swale Shoreline Management Plans (2010) [72];
- Met Office: Climate data (2017) (www.metoffice.gov.uk);
- Ordnance Survey (OS) Landranger 1:50,000 Map;
- Thames River Basin District: River Basin Management Plan (2015) [73];
- South Essex Catchment Flood Management Plan (2009) [74]; and
- Thurrock Council: Strategic Flood Risk Assessment Level 1 and 2 (2009 & 2010) [75,76].

8.152 Site-specific hydrological data will be obtained via consultation with the EA, Lead Local Flood Authority, from Envirocheck/Groundsure, and site reconnaissance (if required).

8.153 The baseline characterisation set out above will identify both sensitive receptors with potential to be affected by the proposed development and sources of potential environmental impact on the proposed development.

Approach and Scope of the Assessment

8.154 The assessment will consider the effects of the proposed development during the construction, operation and decommissioning phase, which could potentially include:

- temporary changes to surface water flows within Flood Zone 3 (including functional floodplain) during construction;
- increase in flood risk from increasing the impermeable surfacing at the site during construction (or the reverse for decommissioning phase);

- increase in temporary flood risk from changing the surface run off during construction;
- loss of floodplain storage;
- pollution of surface watercourses within or near the proposed development area during construction, operation and decommissioning, due to spillages or polluted surface water runoff entering the watercourse; or
- deterioration of water quality of nearby watercourses / water bodies and WFD objectives.

8.155 The assessment will also consider the potential flood risk to the proposed development.

8.156 The approach to assessment of impacts on groundwater is set out in the Geology, Hydrology and Land Contamination section, below.

8.157 The probability of harm occurring to receptors will be assessed, taking into account potential sources of flooding or water contamination and viable pathways of exposure. The significance of predicted effects will be determined by consideration of the sensitivity of the key attributes of the hydrological environment (including WFD status) and flood risk that may be affected and the magnitude of the predicted impact.

8.158 Effects on surface water features (including water dependent habitats), surface drainage and water quality will be assessed in the context of an outline drainage design and Flood Risk Assessment (FRA).

8.159 A FRA is required in accordance with the NPPF and NPS EN-1 due to the size (over 1 ha) and location of the proposed development site (entirely in Flood Zone 3). The FRA will be undertaken with reference to the surface water drainage strategy for the proposed development, and will consider risks to the proposed development from flooding as well as the potential for the proposed development to increase flood risk elsewhere. This will aid in informing the design of the proposed development (including finished ground and floor levels) as well as the EIA.

8.160 The FRA will follow up to date guidance and practice, using hydrological model data supplied by the EA and the Government's climate change allowance guidance (currently dated February 2016) [77].

8.161 The assessment will consider the current baseline environment, future baseline environment and future period when the proposed development is likely to become operational (including climate change set out above). This will establish whether proposed mitigation is sufficient and whether further mitigation is required.

8.162 Cumulative impacts will be assessed as set out in Section 6, with an assessment scenario that includes all newly consented development in the vicinity of the site (assumed to be permitted, constructed and operational) as part of the future baseline, in order to isolate and understand the potential flood risk effects of the development. Cumulative effects on hydrology and flood risk receptors arising from the proposed development alongside other projects within the area from other industries/activities (e.g., industrial/commercial development, coastal infrastructure) would be included in the assessment.

Summary of Matters Proposed to be Scoped Out

8.163 None proposed.

Geology, Hydrogeology and Land Contamination

Baseline Conditions

8.164 A review of the publicly available British Geological Survey (BGS) borehole records and geological maps indicate that the main development site is underlain by Alluvium (likely to comprise soft clay with peat beds), then the River Terrace Deposits. Bedrock geology beneath the site is indicated to comprise the White Chalk Subgroup (undifferentiated from the Cretaceous Period).

8.165 There appear to have been no anthropogenic activities on the main development site other than for farming and the construction of overhead high-voltage power lines. Immediately to the east of the main development site there is an area designated as an active landfill by the EA. This site is understood to operate under a Waste Management Licence and is listed as comprising Tilbury Ash Disposal Site. Historical landfills are also indicated to be located adjacent to the west of part of the construction access route (Zone H), licenced to accept industrial, commercial and household waste; to the north of Zone D, licenced to accept industrial and commercial waste; and to the northeast of Zone E, licenced

to accept inert, industrial, commercial and licensed wastes. In addition, a number of historical landfills are also indicated to be present in the vicinity of the main development site.

8.166 Below the site, the Alluvium is anticipated to be approximately 8.00 m to 16.00 m in thickness, with organic matter. Beds of peat are expected to be present within the stratum. The River Terrace Deposits are expected to be approximately 3.00 m in thickness and are indicated to comprise gravelly sand and sandy gravel. The gravel will be of flint. The depth to the top of the White Chalk Subgroup will be anticipated between 11.00 m and 19.00 m below ground level.

8.167 The superficial Alluvium is classified by the EA as a Secondary (undifferentiated) Aquifer. The River Terrace Deposits are classified as a Secondary A Aquifer and the White Chalk Subgroup bedrock is classified as a Principal Aquifer.

8.168 The main development site is not located in a Groundwater Source Protection Zone.

8.169 The Natural England MAGIC website [78] indicates that the main development site does not lie within a Groundwater Drinking Water Safeguard Zone or a Surface Water Safeguard Zone.

8.170 It is understood that there are two records of groundwater abstraction licenses located approximately 1.4 km to the northeast of the main development site. One is indicated to be classified as a large abstraction and is used for industrial (petrochemical) use and the other relates to a medium sized extraction used for farming/irrigation use.

8.171 While the main development site is indicated to be underlain by the White Chalk Subgroup (a Principal Aquifer), the environmental sensitivity of groundwater is considered to be low due to the relatively thick likely low permeability Alluvium. The Alluvium will provide a high level of protection to the underlying groundwater within the White Chalk Subgroup should a pollution incident occur. In addition, the site is not indicated to be located within a Source Protection Zone or a Safeguard Zone and the nearest groundwater abstraction (likely to be from the White Chalk Subgroup at depth) is located approximately 1.4 km away.

Approach and Scope of the Assessment

8.172 The following potential impacts may be associated with the proposed development:

- pollution of soils and/or controlled waters during construction, operation[7] or decommissioning, for example due to the accidental spillage of polluting materials (e.g., construction related chemicals, fuels, oils, cement; and vehicle/wheel washing);
- mobilisation of any contamination and dust as a result of general ground disturbance, earthworks, establishment of haul routes and removal of vegetation; and
- potential mobilisation of contaminants of concern within shallow soils and groundwater into the deeper aquifers through any piling process (if required) and/or general earthworks.

8.173 A desk based Phase 1 Preliminary Risk Assessment will be undertaken. This will include an assessment of potential sources of contamination at the site, associated with any historical and current land uses both on site and in the surrounding area. A preliminary conceptual site model will be produced, indicating how any contamination may impact the identified receptors via pollutant linkages. Comments will be provided regarding the suitability of the site for its proposed use together with recommendations for further intrusive investigation to confirm potentially active pollutant linkages, where considered necessary.

8.174 Any requirement for intrusive investigation will be discussed and agreed in advance with the EA and Thurrock Council. From a review of currently available information, it is considered unlikely that there will be any anthropogenic materials or significant sources of contamination present on the main development site. A number of landfills are indicated to be present in the vicinity of the site, which could represent potential sources of contaminants of concern and/or ground gas.

[7] Although operational impacts are considered to be unlikely, as the proposed development will be operated in accordance with an Environmental Permit and will have a managed surface drainage system with oil interceptors, bunding and spill kits in case of accidents.

8.175 An assessment of potential impacts on existing ground conditions and risks to groundwater will be undertaken as part of the EIA. Consideration will be given to potential impacts associated with the construction and operation of the proposed development and how these will be prevented or minimised.

8.176 Based on the assessment of the baseline and the identification of any potential impacts, the ES will make recommendations for mitigation measures. These may include the recommendation for further intrusive investigation to address residual data gaps or better delineate identified contamination hotspots or plumes, quantitative risk assessment, remediation and validation. It will also make recommendations for possible mitigation measures to be employed by contractors, should any previously unidentified contamination be encountered during the construction phase.

Summary of Matters Proposed to be Scoped Out

8.177 None proposed.

Climate Change

8.178 This section of the scoping report considers the assessment of potential impacts on and due to climate change. Climate change here is considered broadly in two domains: the impact of greenhouse gas emissions (GHGs) caused directly or indirectly by the proposed development, which contribute to climate change; and the potential impact of changes in climate to the development, which could affect it directly or could modify its other environmental impacts.

Baseline

8.179 With regard to current climate, the baseline is the local and regional climate and resulting weather patterns, recorded in Met Office data. This is in the context however of trends in global climate changes affecting the UK climate, which at their present rates may be considered part of the known baseline [79].

8.180 With regard to GHG emissions, the baseline is emissions from the existing or likely future generation of electricity that would be displaced by the proposed development. Changes in this baseline would be due to changes in the likely marginal sources displaced.

Scope of Assessment

8.181 *A priori* there may be possibility of significant effects due to: (a) construction, operational and decommissioning stage GHG emissions; and (b) vulnerability of the development to climate change over the course of its operational lifetime and at the time of decommissioning.

8.182 GHG emissions would contribute to the effect of global climate change. Assessment guidance [80] indicates that in principle, any GHG emissions may be considered to be significant, and advocates as good practice that GHG emissions should always be reported at an appropriate, proportionate level of detail in an ES.

8.183 With regard to operational GHG emissions, the main impact would be direct GHG releases from natural gas combustion, comprising mainly CO_2 with a minor component of CH_4 and N_2O. Indirect GHG emissions would also be generated through the supply chain for the facility's gas fuel consumed in operation; these are expected to be relatively minor compared to the direct GHG releases but are proposed to be included in the assessment. GHG emissions from other operational activities (e.g. occasional maintenance staff traffic and non-fuel process consumables, e.g. lubricants) are considered to be *de-minimis* and not proposed to be assessed.

8.184 GHGs that would otherwise be emitted to deliver power at the margin, which will be avoided due to generation by the proposed developments, are also within the scope of the assessment to calculate net GHG impacts. Contribution of the proposed development to the UK's flexible generation resource and the effect that this has on supporting further deployment of intermittent renewable generation will also be considered where possible (likely on a qualitative basis).

8.185 With regard to construction-stage GHG emissions, the main impact would be the 'embodied carbon' in construction materials used, i.e. the indirect GHG emissions from the supply chain for those materials. These are expected to be relatively minor compared to operational emissions, but also to have higher uncertainty, and so are proposed to be estimated where possible to consider whether effects may be significant. This will depend on the availability of published data such as lifecycle Environmental Performance Declarations (EPD)

for components of the proposed development. Direct GHG emissions from construction activities (e.g. fuel consumption by construction plant) are considered to be *de-minimis* and not proposed to be assessed.

8.186 Decommissioning-stage GHG emissions would depend principally on the recycling/re-use options for components of the proposed development at the time. The proposed development would not generate significant volumes of decommissioning waste of a nature that gives rise to direct GHG emissions (e.g. from decomposition or incineration) from any inert residual waste requiring disposal. Where published EPDs for development components include end-of-life within the lifecycle boundary, these impacts will be included in the assessment. In other cases, no additional GHG impacts (adverse or beneficial) relative to the future baseline prevailing rate of recycling and re-use in the manufacturing sector at the time of decommissioning can be predicted with confidence and these are not proposed to be assessed.

8.187 With regard to the impacts of climate change on the development itself or on modifying its impacts on other receptors, the main impact is change in flood risk and disaster risk due to sea level change, surface watercourse flow change, and change in peak rainfall intensities and/or the probability of extreme rainfall events or extreme storm surge events. This impact could affect flood risk on the development site or could modify the flood risk caused by the development to other receptors. This impact will be assessed in the Hydrology and Flood Risk Assessment elements of the EIA, as detailed above.

8.188 Changes in climate over the proposed development's operational lifetime may also stress the ecosystems of designated habitats in the local area, potentially reducing their resilience to any environmental impacts from the development (e.g. nitrogen deposition). If relevant, this will be considered in the ecology and biodiversity assessment.

8.189 With regard to impacts of climate change on the development itself, these are not considered to be significant over the proposed development's operational lifetime

of around 35 years. The Met Office UK Climate Projections ('UKCP09')[8] dataset [81, 82], which provides probabilistic projections of change in climatic variables in regions of the UK over time under several potential future global emissions scenarios, has been reviewed to consider the extent of likely changes during this timeframe under a high emissions scenario to be conservative. Aside from changes in rainfall and flood risk (discussed above), the other predicted changes in temperatures, humidity and wind speed are not of a sufficient magnitude to require any specific design response for resilience or to impact on the proposed development's operation.

Assessment Approach

8.190 Direct and indirect operational GHG emissions caused by the proposed development will be calculated based on the fuel combustion for energy generation. The emissions of marginal displaced grid electricity generation due to exported electricity will be calculated, and from this the net emissions attributable to the proposed development derived. Annual operational GHG emissions and cumulative total GHG emissions over the proposed operating lifetime (taking into account changes in the future baseline such as grid electricity generation decarbonisation, where feasible) will be presented in the ES. Emissions factors and projections published by BEIS and Defra will be used.

8.191 The boundary of the operational assessment will be direct GHG emissions from combustion and indirect lifecycle GHG emissions from gas fuel supply for the proposed development, and the equivalent boundary for the average of grid-connected electricity generators whose generation is displaced by exported electricity.

8.192 Indirect construction-stage GHG emissions caused by the proposed development will be calculated insofar as possible based on for published EPDs for major engineered components (e.g. gas engines, batteries, electrical equipment) where these are available, and based on published lifecycle emissions factors for the construction materials whose volume and carbon intensity are estimated to be

[8] CP09 is presently being updated to CP18, which is expected to be published during 2018. If CP18 is available prior to completion of the EIA, it will be reviewed to assess whether changes in projections alter the conclusion regarding climate risks as set out above.

most significant (e.g. concrete and steel). The boundary of the assessment will be defined by the available published lifecycle assessments for such materials and components.

8.193 There are no clear, generally-agreed thresholds or methods for evaluating the significance of GHG impacts in EIA. The IEMA guidance referenced above recommends contextualising a development's GHG impacts, for example on a sectoral basis or compared to the UK's national carbon budget.

8.194 It is considered that broadly speaking, the significance of the proposed development's GHG emissions can be contextualised in the following ways:

- with reference to the absolute magnitude of net GHG emissions as a percentage of the UK's national carbon budgets during its operational lifetime;
- through comparing the GHG emissions intensity of the proposed development (i.e. tCO_2e/MWh of useful energy generated) with other sources of peaking power generation;
- with reference to whether the proposed development contributes to and is in line with the UK's national carbon budget sectoral goals for GHG emissions reduction, which are consistent with science-based commitments to limit global climate change to an internationally-agreed level; and
- with reference to whether the proposed development contributes to and is in line with the UK's policy for energy generation and security of supply, including enabling greater uptake of intermittent low/zero-carbon renewable energy generation.

8.195 Taking these factors into account, where applicable, the evaluation of significance will ultimately be a matter of professional judgement, as it is not considered that a fixed numerical threshold can be defined.

8.196 The significance of GHG emissions is by nature cumulative with all other global sources in its effect on the receptor 'atmospheric concentration of GHGs', so this will form part of the assessment of significance using criteria as set out above. Cumulative impacts of other specific developments are therefore not proposed to be assessed individually.

Summary of Matters Proposed to be Scoped Out

8.197 Climate change risks and adaptation other than flood risk, as predicted changes during the proposed development's expected operational lifetime are not of a sufficient magnitude to require any specific design response for resilience or to impact on the proposed development's operation.

9 Identification of Non-Significant Environmental Topics

9.1 This section describes avenues of potential environmental impact that are not considered to have potential for likely significant environmental effects. Matters considered in this section include those listed in Schedule 4 of the EIA Regulations that have not been addressed in Section 8 of the Scoping Report, above, and other matters that are considered to have no likely significant effects or to be outwith the scope of EIA.

9.2 The matters described in this section are proposed to be scoped out of the EIA save where elements (identified below) would be assessed through topics listed in Section 8.

Environmental Effect of Vulnerability to Major Accidents or Disasters

9.3 The main major accidents or disasters to which the proposed development may be vulnerable are considered to be flooding or fire/explosion.

9.4 Potential flood risks to the proposed development and any necessary design mitigation will be assessed in the hydrology and flood risk chapter based on applicable Strategic Flood Risk Assessment mapping or most up to date published information available at the time of preparing the EIA, as set out in Section 8. With appropriate mitigation, the proposed development will not have unacceptable vulnerability to flooding and a separate assessment of flood disaster (in addition to the flood risk assessment) is therefore proposed to be scoped out.

9.5 The proposed development is not expected to be a COMAH site, as it would not have gas storage on-site and the pipeline inventory would be below the lower-tier COMAH threshold. From consultation with HSE, it is understood to be within the major accident hazard consultation zone for the NTS pipeline and also within an HSE explosive zone. The ES will include in the project description chapter discussion of Thurrock Power's principles for emergency management, including gas safety and fire prevention and control, to mitigate fire and explosion risks. Emergency response plans and contingency measures will be a requirement of

the Environmental Permit and Thurrock Power's response plan will be developed in consideration of the off-site hazards highlighted by the HSE, as well as accidents or emergencies arising from the proposed development itself.

9.6 A separate ES chapter concerning environmental effects arising from vulnerability of the proposed development to major accidents or disasters is proposed to be scoped out of the EIA, with the risks being addressed in the flood risk assessment and through emergency management plans developed due to existing regulatory requirements, which will be referenced in the ES project description as set out above.

Human Health

9.7 Potential for impacts on human health via environmental pathways including air pollutant or noise emissions, ground or water contamination will be assessed to environmental standards set to be protective of health in the respective ES topic chapters. Due to the nature of the proposed development as an electricity generator and storage plant, distant from residential receptors, with minimal traffic or employment generation after construction and no impact on existing community infrastructure or services, no significant impacts on human health are considered likely. A separate EIA chapter is proposed to be scoped out, with health assessed through the relevant environmental pathways as set out above.

Waste Management

9.8 As set out in the project and site description, there is no existing development that will require demolition and the volume of construction-stage waste that is anticipated to be generated is therefore not significant. In the interests of cost and environmental impact, construction cut and fill volumes will be balanced as closely as possible.

9.9 A Construction Environmental Management Plan (CEMP), which will be produced in draft for inclusion with the ES and finalised following grant of a DCO, will set out how waste will be managed during construction. The CEMP will detail management measures to minimise waste generation and manage waste arisings in accordance with the Waste Hierarchy. It is considered that as the proposed development will comprise principally pre-fabricated, packaged

components (i.e. the gas reciprocating engines, batteries, and electrical equipment) manufactured off-site and assembled on-site, the potential for construction waste generation will be minor, given the limited civil and structural works required for the proposed development. Considering the mitigation and management measures that would be implemented through the CEMP, assessment of construction waste impacts is proposed to be scoped out of the EIA.

9.10 Operation of the proposed development does not involve any significant waste-generating activities. Small amounts of waste would be associated with periodic maintenance activities, such as spent lubrication oils. The facility will largely be operated remotely and there will be no permanent staff present on a day to day basis to generate domestic-type waste. Given that the facility will be subject to operation under an environmental permit issued by the Environment Agency, waste minimisation and application of the waste hierarchy are relevant considerations under the environmental permitting regime. Information to demonstrate how this will be achieved will need to be provided in the permit application and will be assessed by the Environmental Agency before issuing the permit. During the operational life the permit will include conditions to review raw material and waste generation and consider available alternatives to ensure the facility continues to operate Best Available Technology throughout its operational life. On the basis of the above, operational waste is considered non-significant and therefore proposed to be scoped out of the EIA.

9.11 The project description in the ES will set out the potential options for decommissioning at the end of the proposed development's operational life. As discussed briefly in Section 3 of this report, decommissioning would be facilitated by the modular construction of the proposed development, and depending on subsequent land-uses for the site, may not require deconstruction of foundations or other below-ground infrastructure. It is considered that given the pre-engineered, modular nature of much of the proposed development (facilitating removal of components off-site for recycling or refurbishment and reuse at the end of life), decommissioning waste generation would be limited and can be managed effectively in accordance with the Waste Hierarchy and prevailing waste management legislation at the time. Assessment of decommissioning

waste generation environmental impacts is therefore proposed to be scoped out of the EIA.

Material Assets and Natural Resources

9.12 As the proposed development would be on un-developed agricultural and Common Land, no other material assets or infrastructure would be adversely affected. The existing high-voltage overhead power lines crossing the land would be retained. Agricultural and Common Land impacts will be assessed in the ES as set out in Section 8.

9.13 The principal natural resource consumed in operation would be gas fuel for the reciprocating engines. The fuel volume consumed, energy efficiency of the development and resultant impacts on greenhouse gas emissions would be assessed in the climate change chapter, as set out in Section 8.

9.14 A separate chapter on material assets or natural resources consumption is therefore proposed to be scoped out of the EIA.

Radiation

9.15 The proposed development would not be a source of ionising radiation. Electrical infrastructure (substations and underground cable(s)) would be a source of non-ionising power-frequency electric and magnetic fields (EMF). However, given the location of the development immediately adjacent to the existing Tilbury Substation with minimal distance for the grid connection, there is no potential for public exposure to EMF generated. Power-frequency EMF is managed by the electricity industry under a Code of Practice published by the (former) DECC within guideline limits set to protect occupational and public health.

9.16 The envelope of potential building heights, height of gas engine stacks (up to 40 m) and expected temporary construction cranes will be no higher than the existing stacks associated with nearby structures, including the 100 m high stack of Tilbury Green Power station and the recently demolished 171 m high stacks of the Tilbury Power Station or its 62 m high boiler houses. Therefore an assessment of the proposed development's impact on electronic interference is not considered to be required.

Heat and Light

9.17 The gas engines and batteries will be provided with appropriate cooling systems. The impact of waste heat in the case of a water cooling option from the Thames will be assessed in the Aquatic Environment chapter.

9.18 No adverse environmental impact from heat in the case of the air cooling option is considered likely.

9.19 Security lighting for the main development site may be required. Potential for impacts on ecology would be considered in the ecology chapter. Given the distance to residential receptors, no other lighting impacts are considered likely.

9.20 Assessment of heat and light, save for potential impacts on light on ecology and heat on marine ecology with the water cooling option, is therefore proposed to be scoped out of the EIA.

Aviation

9.21 The Civil Aviation Association (CAA) has a general interest in charting all known structures of 91.4 m (300 feet) or more above ground level. The proposed development stacks will be the tallest element at up to 40 m in height.

9.22 Given the main development site's distance to the nearest major airports (London City Airport at around 23 km west of the main development site and London Southend Airport around 25 km north east; the private Thurrock Airfield, at around 8.5 km distance, is used by an aircraft maintenance business), and the presence of significant tall structures in surrounding areas, it can be reasonably assumed that none of the proposed buildings or structures will significantly impact aviation and assessment is proposed to be scoped out of the EIA.

9.23 The CAA will, however, be consulted concerning review any requirements for aviation lighting on the stacks and to enable the proposed development to be charted.

Combined Heat and Power (CHP) Assessment

9.24 Although not formally part of the EIA, it is usually a requirement of NPS EN-1 that applicants for new thermal power stations explore and develop feasible CHP

opportunities. This is in order to maximise the use of waste heat and in turn the thermal efficiency of the combustion plant.

9.25 Chapter 3, Article 14, Paragraph 6(a) of the Energy Efficiency Directive 2012/27/EU allows for the exemption of "*those peak load and back-up electricity generating installations which are planned to operate under 1500 operating hours per year as a rolling average over a period of five years…*" from the Directive's requirement that CHP cost-benefit analysis is undertaken of new thermal electricity generation facilities of >20 MW thermal input.

9.26 Although the proposed development may, subject to agreement with the EA, operate for up to 2,750 hours per year (above the 1,500 hours per year rolling average in the exemption), it would remain a peaking plant and the same logic for inapplicability of CHP applies. Heat users in general require consistent or at least predictable availability of heat. A peaking power plant is likely to have waste heat available only intermittently, for potentially short intervals, and at times that cannot be relied upon consistently (notwithstanding typical daily and seasonal patterns of peak energy demand, its function is essentially unpredictable). This being the case, whether total annual operation is for 1,500 hours or 2,750 hours, a peaking power plant is inherently poorly suited to combined heat and power generation, as is recognised by the Directive's exemption.

9.27 Assessment of CHP opportunities and environmental impacts of the development of CHP infrastructure is therefore proposed to be scoped out of the EIA process.

Carbon Capture Readiness

9.28 The proposed development would have a gross electrical generating capacity from the combustion plant (gas engines) of more than 300 MW, the threshold for being required to be 'Carbon Capture Ready' (CCR) under the Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013.

9.29 The applicant for development consent is required to demonstrate that sufficient land is available for future carbon capture and storage (CCS) and that it would be technologically and economically feasible. CCR land set aside for CCS is shown on Figure 3.

9.30 A possible future CCS development is not among the works for which development consent is sought in this application. It would be subject to development consent at the time.

9.31 The impact of CCR – i.e. the land-take required to be set aside – will be assessed as part of the EIA. Impacts of a specific CCS development within that CCR land will not be assessed, as details are unknown and cannot be established with sufficient certainty for EIA, and such a development, if sought in the future, would be subject to development control and EIA if required at the time.

Transboundary Effects

9.32 Due to the location and nature of the proposed development, there is considered to be no potential for transboundary impacts, and therefore the need for an assessment of transboundary effects is proposed to be scoped out of the EIA process.

Abbreviations

ADMS	Atmospheric Dispersion Monitoring System
ALC	Agricultural Land Classification
APIS	Air Pollution Information System
AQMA	Air Quality Management Area
BAT	Best Available Technology or Techniques
BEIS	Department for Business, Energy and Industrial Strategy
BGS	British Geological Survey
BS	British Standard
CAA	Civil Aviation Authority
CCGT	Combined Cycle Gas Turbine
CCR	Carbon Capture Readiness
CCS	Carbon Capture and Storage
CDM	Construction (Design and Management) Regulations 2015
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CO_2	Carbon dioxide
CoCP	Code of Construction Practice
COMAH	Control of Major Accident Hazards
COPA	Control of Pollution Act 1974
CRTN	Calculation of Road Traffic Noise
DCLG	Department of Communities and Local Government
DCO	Development Consent Order
DECC	(former) Department for Energy and Climate Change
Defra	Department for the Environment, Farming and Rural Affairs
DMRB	Design Manual for Roads and Bridges
DTM	Digital Terrain Model
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EMR	Electricity Market Reform

ES	Environmental Statement
FRA	Flood Risk Assessment
GW	Gigawatts
HA	(former) Highways Agency (now Highways England)
ha	hectare
HCA	Homes and Communities Agency
HE	Historic England
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HHRA	Human Health Risk Assessment
HMSO	Her Majesty's Stationary Office
HSI	Habitat Suitability Index
IAQM	Institute of Air Quality Management
IED	Industrial Emissions Directive
IEMA	Institute of Environmental Management and Assessment
ISO	International Organization for Standardization
km	kilometre
LCA	Landscape Character Area
LNR	Local Nature Reserve
LWS	Local Wildlife Site
m	metres
MCZ	Marine Conservation Zone
MW	Megawatts
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
NPPW	National Planning Policy for Waste
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
OCGT	Open Cycle Gas Turbine
OS	Ordnance Survey
PARCA	Planning and Advanced Reservation of Capacity Agreement
PEI	Preliminary Environmental Information
PINS	Planning Inspectorate

PRoW	Public Right of Way
SAC	Special Area of Conservation
SCR	Selective Catalytic Reduction
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

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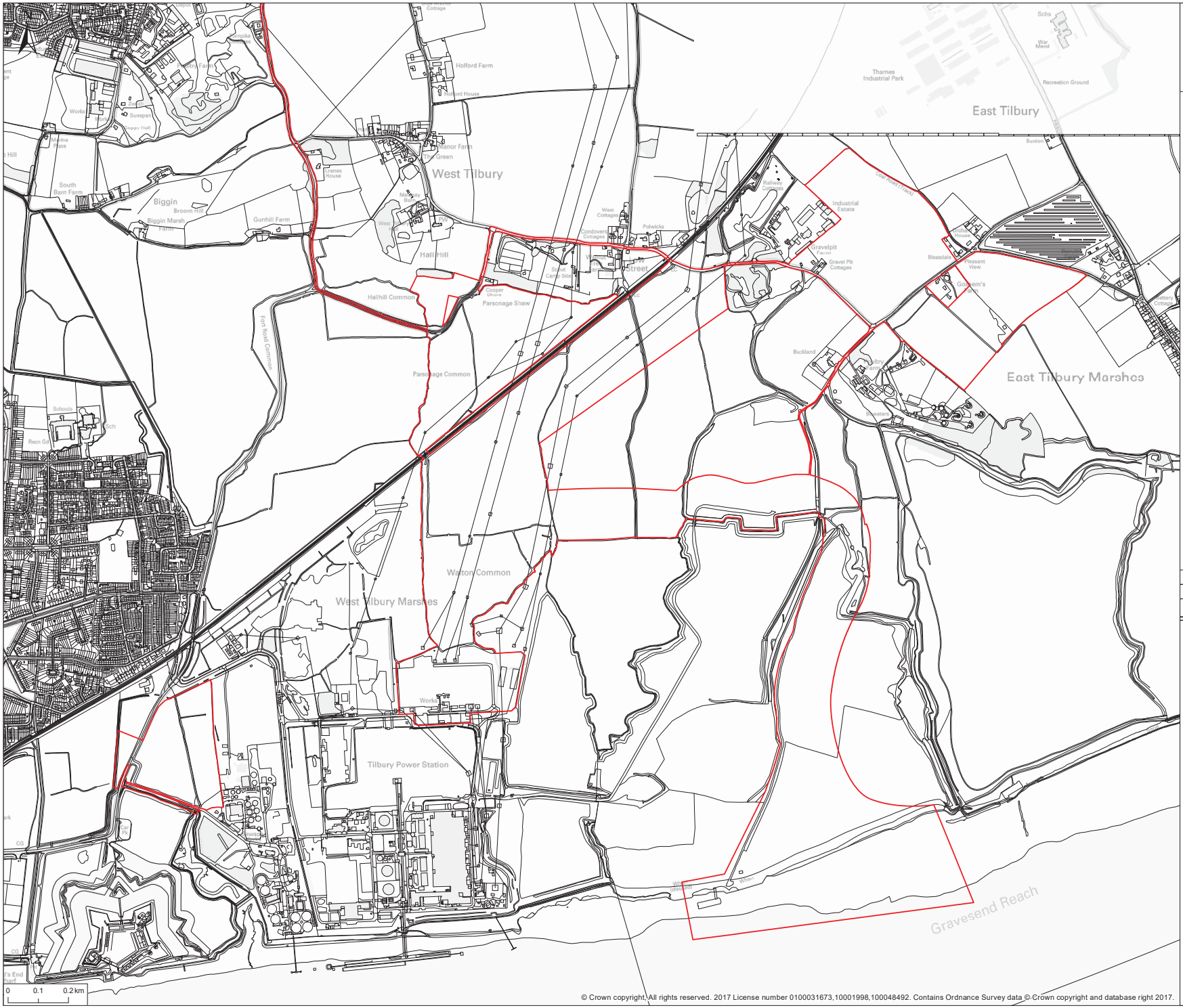
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Project	Thurrock Flexible Generation Plant
Title	Development Boundary

Status	Drawn By:	PM/Checked By
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Job Ref	**Scale @ A3**	**Date Created**
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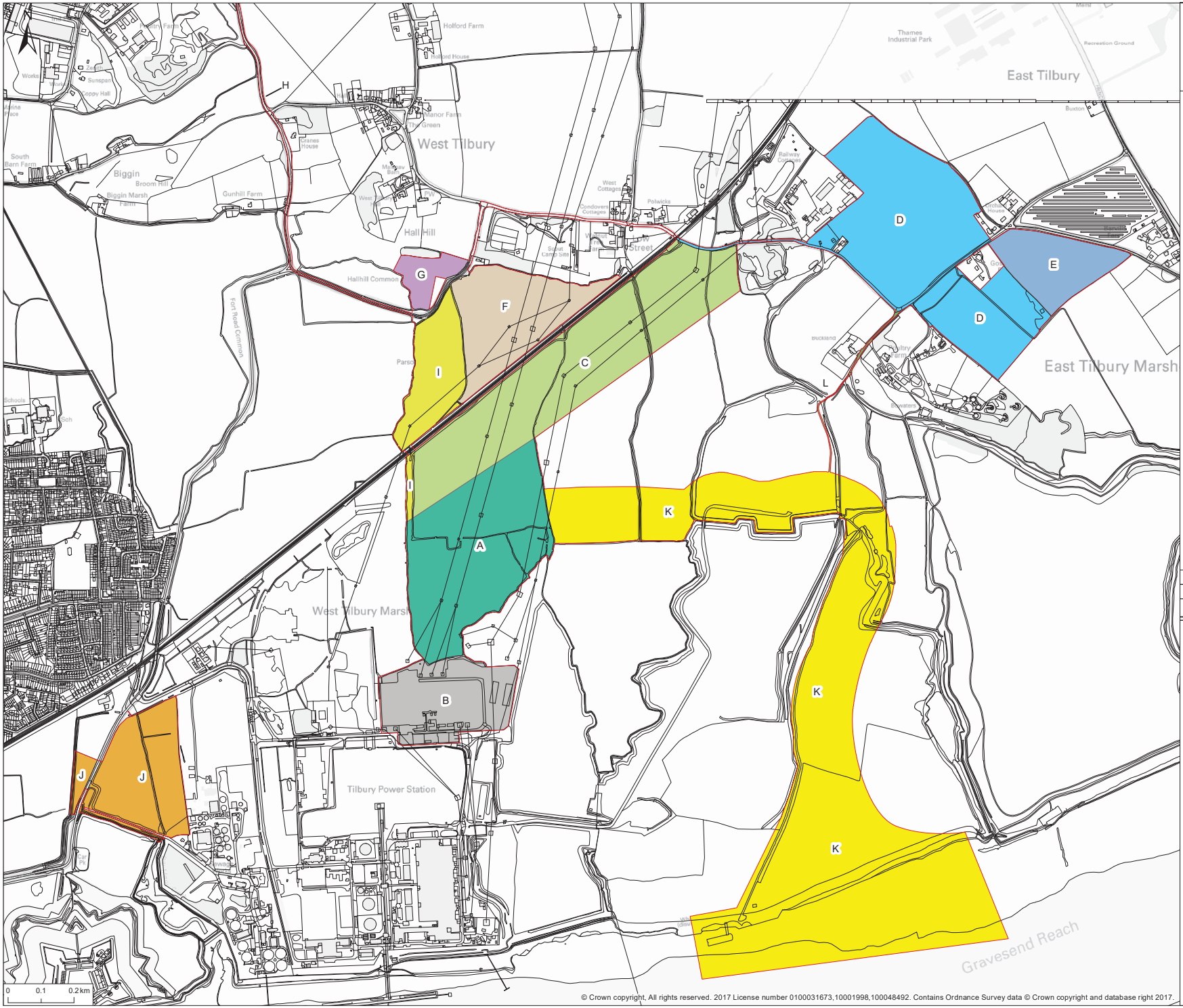
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Legend

- Development boundary
- A - Main Development Site where the gas fired facility, battery storage facility and customer substation will be located
- B - The existing Tilbury Substation to which an electrical connection will be made
- C - Corridor for vehicle access, gas and other service connections
- D - Corridor for gas pipeline
- E - Field within which above-ground installation for connection to high-pressure gas main will be made
- F - Primary area within which exchange Common Land could be provided
- G - Secondary area within which exchange Common Land could be provided
- H - Access route using existing roads but requiring minor works to accommodate HGV tracking
- I - Existing Common Land which might be used as an alternative access
- J - Possible S106 planning gain land
- K - Corridor for potential cooling water pipe, intake/discharge, and construction haul from existing jetty
- L - Potential temporary construction access to Zone K

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Project: Thurrock Flexible Generation Plant

Title: Development Zones

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Project	Thurrock Flexible Generation Plant
Title	Development Zones

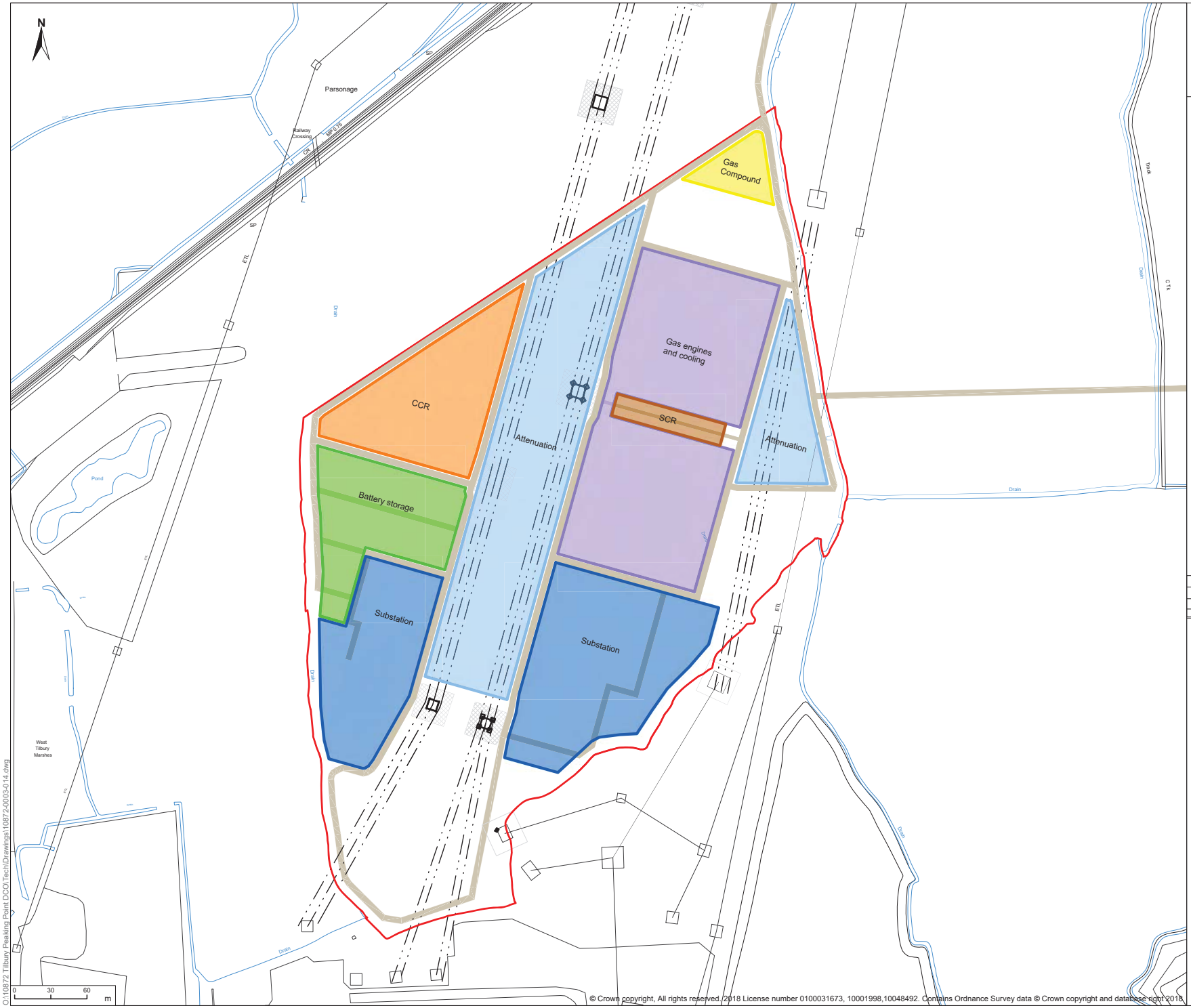
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Legend

- Development site
- Tracks
- Gas engines and cooling
- Substations
- Battery storage
- Gas compound
- SCR area
- CCR area
- Attenuation area

Rev	Description	Date	Initial	Checked

RPS

20 Western Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4SH
T: +44(0)1235 821 888 **E:** rpsox@rpsgroup.com **F:** +44(0)1235 834 698

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Indicative Development Layout

Status	Drawn By	PM/Checked by
DRAFT	RM	TD
Job Ref	**Scale @ A3**	**Date Created**
OXF10872	1:3,000	Jul 2018
Figure Number		**Rev**
3		-

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Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Baseline Site Photograph

Status	Drawn By:	PM/Checked By
DRAFT	MS	--
Job Ref	**Scale @ A3**	**Date Created**
OXF10872	1:90,000	JUL 2018

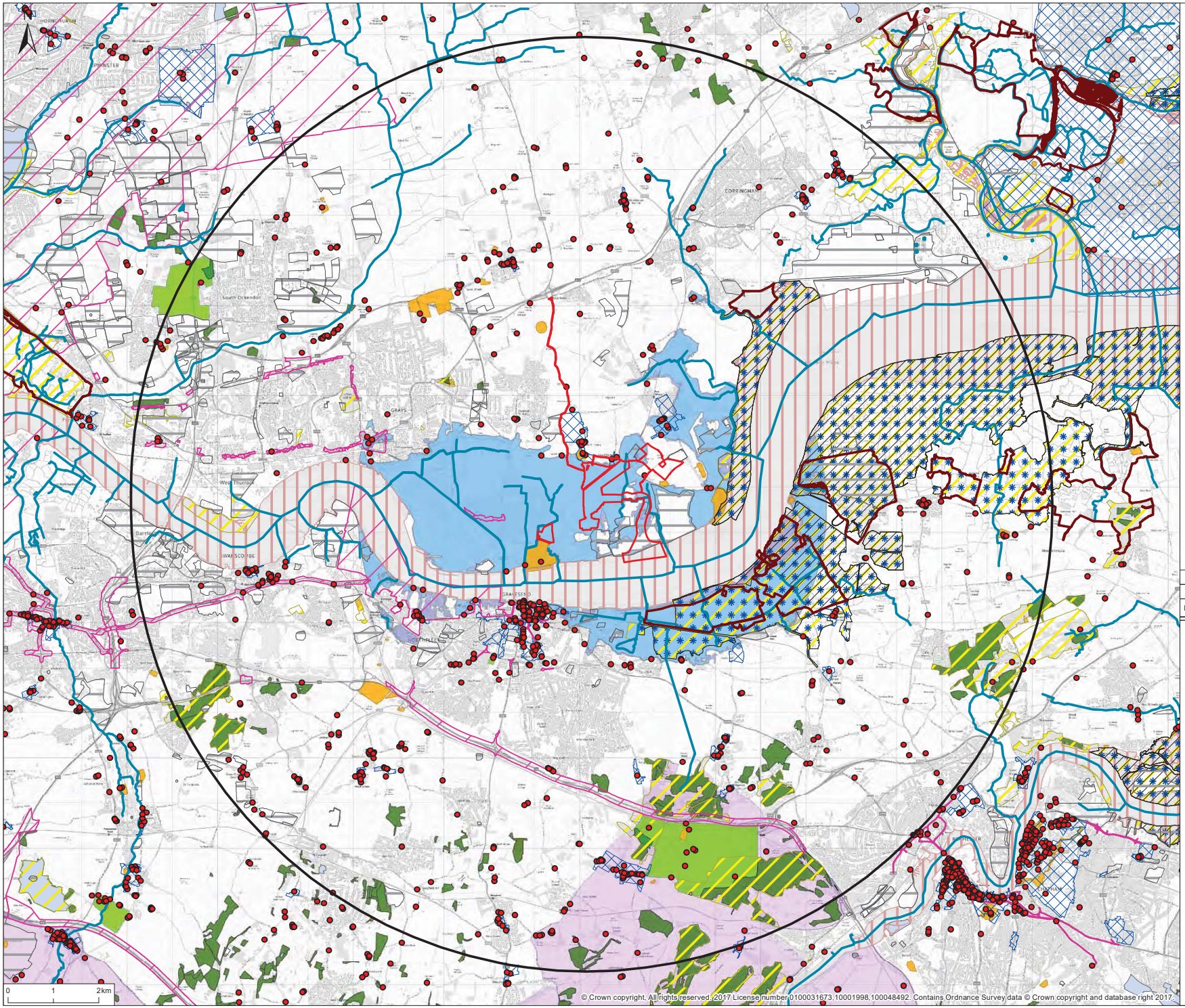
Figure Number: **4**

Rev: **-**

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Legend

- Development boundary
- 10km radius buffer from main development site
- Listed Building
- Scheduled Monument
- Registered Park and Garden
- Conservation Area
- RSPB Reserve
- Special Protection Area
- Special Area of Conservation
- Site of Special Scientific Interest
- Ramsar site
- Local Nature Reserve
- Marine Conservation Zone
- Ancient Woodland
- Watercourse
- Flood Zone 3
- Flood Zone 2
- Historic Landfill Sites
- Air Quality Managment Area

Rev	Description	Date	Initial	Checked

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Client	Thurrock Power Ltd
Project	Thurrock Flexible Generation Plant
Title	Site Sensitivities Plan – Small Scale

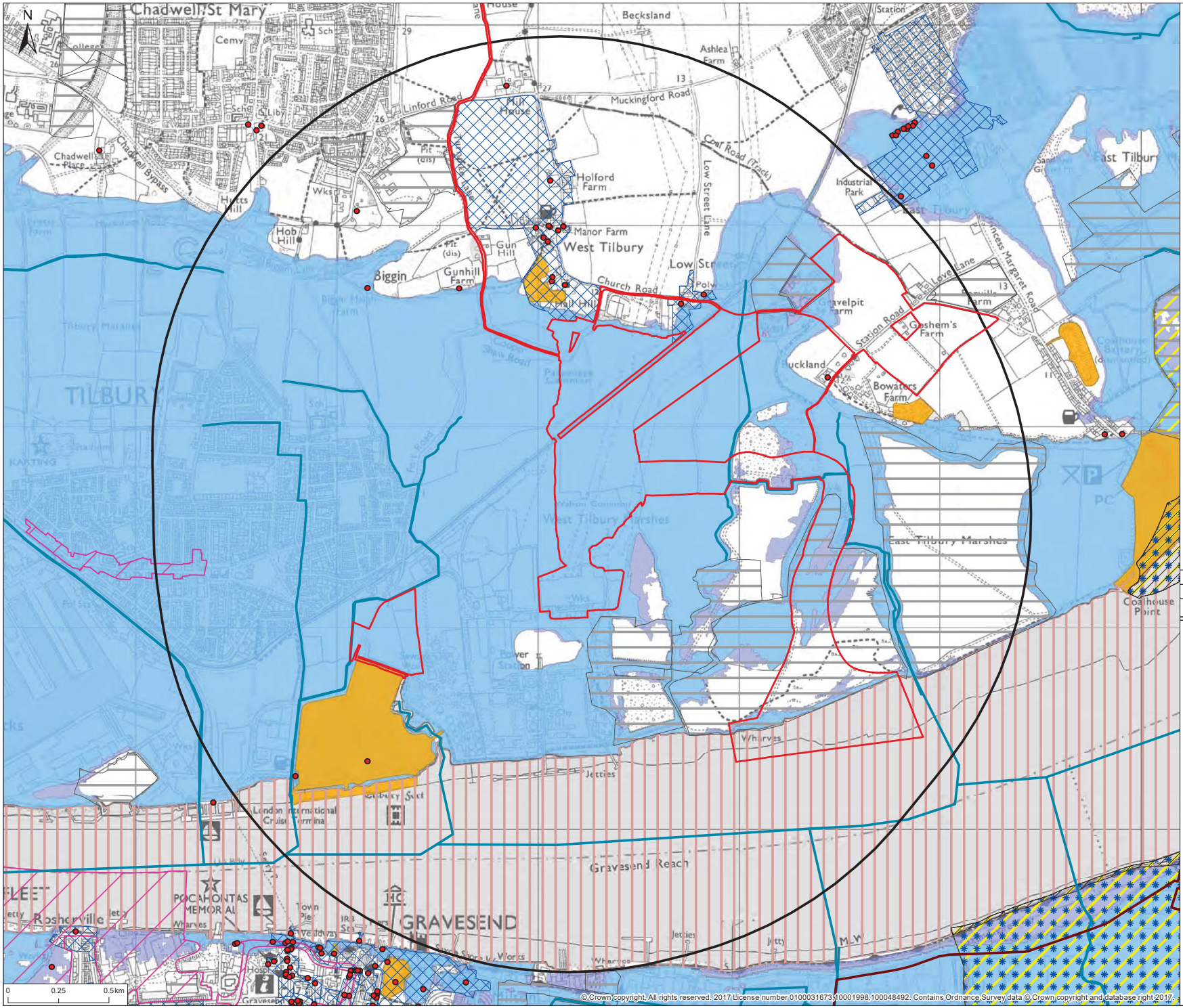
Status	Drawn By:	PM/Checked By
DRAFT	MS	TD
Job Ref	**Scale @ A3**	**Date Created**
OXF9671	1:80,000	JUL 2018

Figure Number	Rev
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Legend

- Development boundary
- 2km radius buffer from main development site
- Listed Building
- Scheduled Monument
- Conservation Area
- RSPB Reserve
- Special Protection Area
- Site of Special Scientific Interest
- Ramsar site
- Marine Conservation Zone
- Watercourse
- Flood Zone 3
- Flood Zone 2
- Historic Landfill Sites
- Air Quality Managment Area

Rev	Description	Date	Initial	Checked

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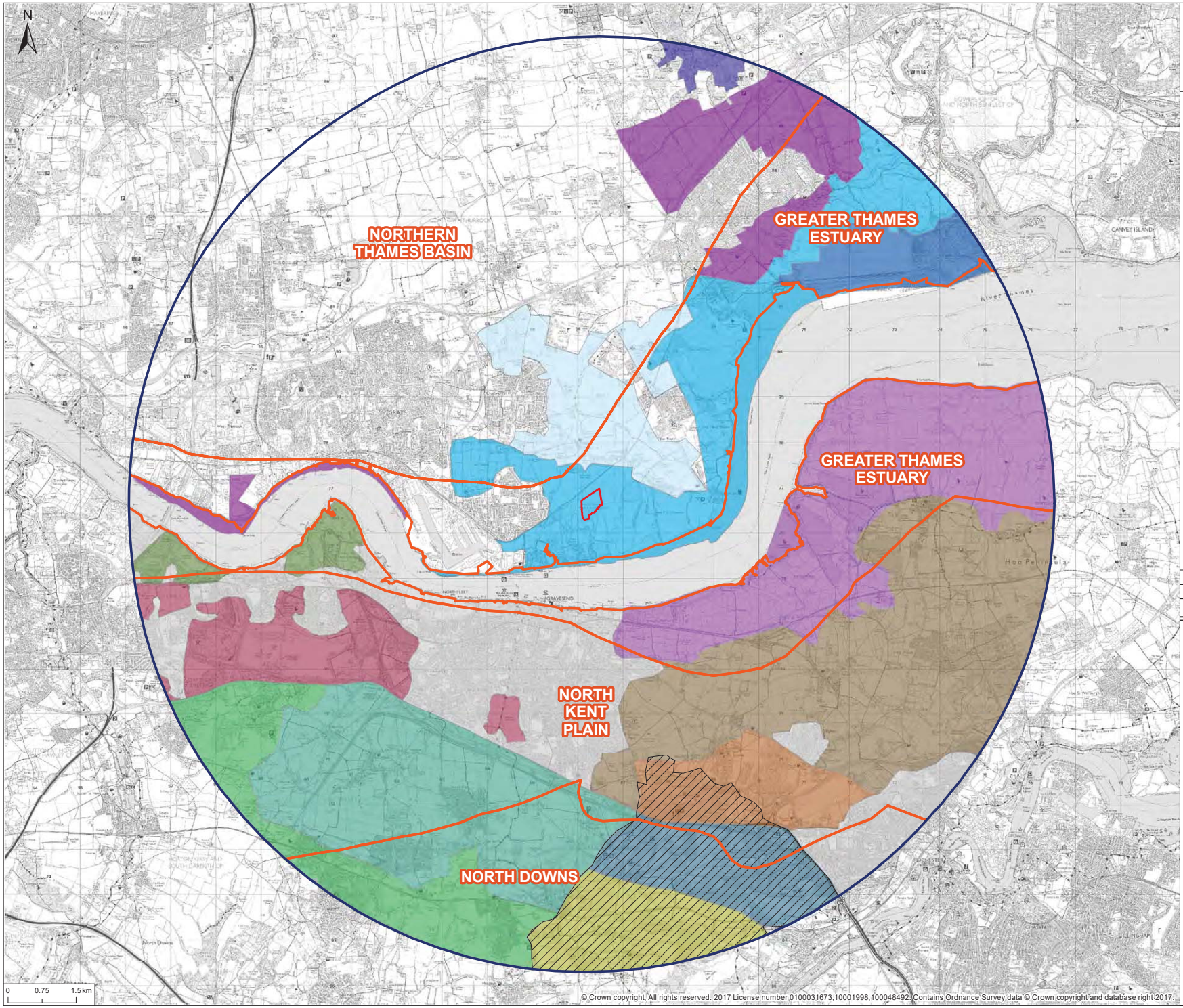
Client	Thurrock Power Ltd
Project	Thurrock Flexible Generation Plant
Title	Site Sensitivities Plan – Large Scale

Status	Drawn By:	PM/Checked By
DRAFT	MS	TD
Job Ref	**Scale @ A3**	**Date Created**
OXF9671	1:18,000	JUL 2018
Figure Number		**Rev**
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Legend

- Site location
- 10km study area
- National Character Areas

Essex Landscape Character Areas
- South Essex Coastal Towns

Essex Coast Landscape Character Areas
- West Canvey Shellhaven
- Mucking Fobbing
- East Tilbury Corringham
- Chadwell and West Tilbury
- Averley Wennington Marshes

Kent Landscape Character Areas
- Cobham: West Kent Downs
- Darenth Downs
- Dartford and Gravesend Fringes
- Eastern Thames Marshes
- Hoo Peninsula
- Luddesdown: West Kent Downs
- Shorne
- Southfleet Arable Lands
- Western Thames Marshes
- Urban

Kent Downs Landscape Character Areas
- West Kent Downs

Rev	Description	Date	Initial	Checked

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Client	Thurrock Power Ltd
Project	Thurrock Flexible Generation Plant
Title	National and County Character Areas

Status	Drawn By:	PM/Checked By
DRAFT	CR	CD
Job Ref	**Scale @ A3**	**Date Created**
OXF10872	1:80,000	JUL 2018

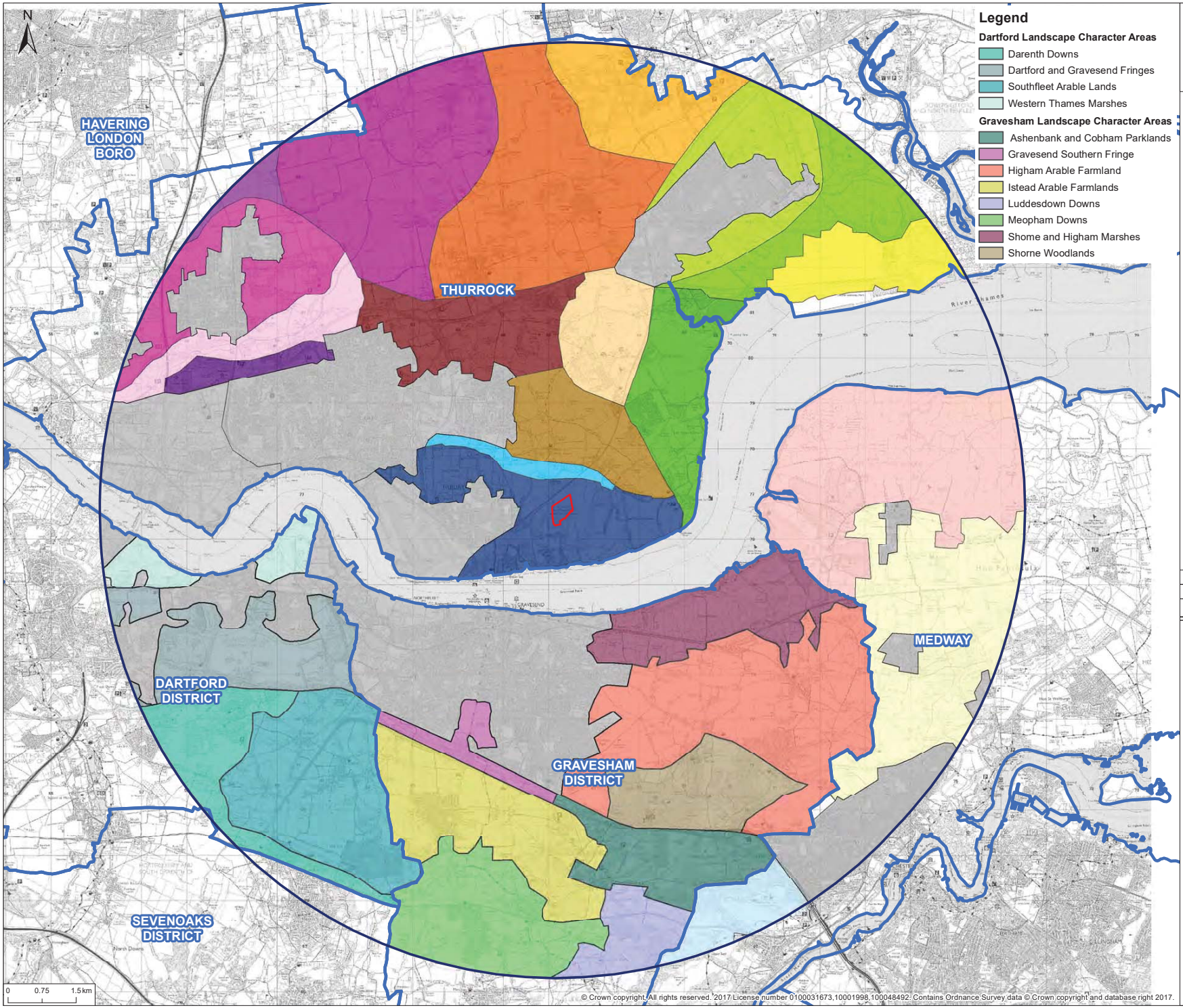
Figure Number: **7** Rev: **-**

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Legend

Dartford Landscape Character Areas

- Darenth Downs
- Dartford and Gravesend Fringes
- Southfleet Arable Lands
- Western Thames Marshes

Gravesham Landscape Character Areas

- Ashenbank and Cobham Parklands
- Gravesend Southern Fringe
- Higham Arable Farmland
- Istead Arable Farmlands
- Luddesdown Downs
- Meopham Downs
- Shome and Higham Marshes
- Shorne Woodlands

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Legend

- Site location
- 10km study area
- District boundary
- Urban

Medway Landscape Character Areas

- Eastern Thames Marshes
- Hoo Peninsula
- North Downs and Medway Valley

Thurrock Landscape Character Areas

- Aveley / South Ockendon Urban Fringe
- Tilbury Marshes
- Belhus Rolling Farmland / Wooded Hills
- Bulphan Fenland
- Chadwell Escarpment Urban Fringe
- Coryton and Marshes
- Fobbing Marshes
- Fobbing Ridge Rolling Farmland / Wooded Hills
- Langdon Hills Rolling Farmland / Wooded Hills
- Linford / Buckingham Hill Urban Fringe
- Mar Dyke River Valley Urban Fringe
- Mucking Flats and Marshes
- North Stifford Corridor Urban Fringe
- Sticking Hill Rolling Farmland / Wooded Hills
- West Tilbury Urban Fringe
- White Crofts / Orsett Heath Urban Fringe

Rev	Description	Date	Initial	Checked

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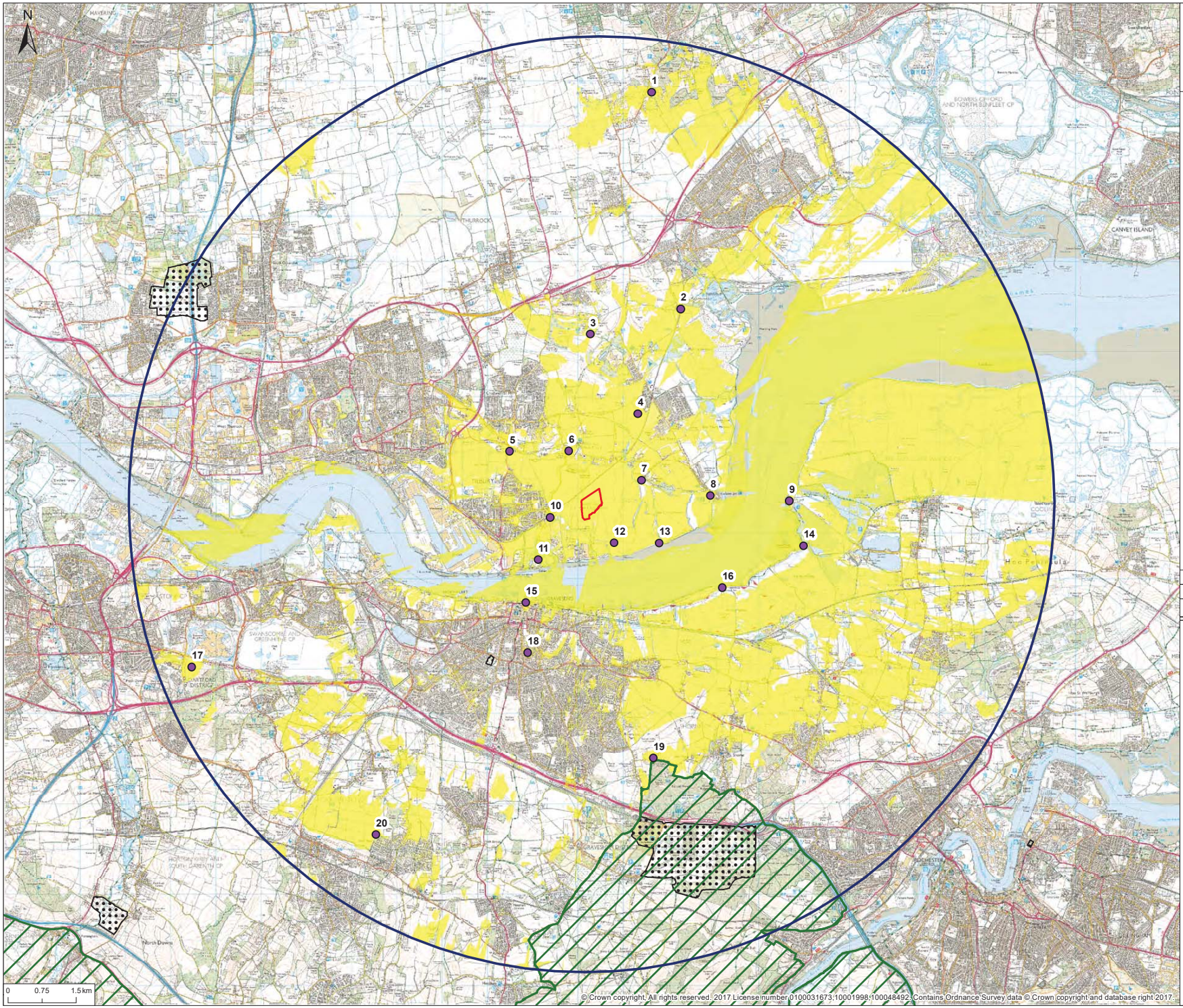
Client	Thurrock Power Ltd
Project	Thurrock Flexible Generation Plant
Title	District Character Areas

Status	Drawn By:	PM/Checked By
DRAFT	CR	CD
Job Ref	**Scale @ A3**	**Date Created**
OXF10872	1:80,000	JUL 2018
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Legend

- Site location
- 10km study area
- Kent Downs AONB
- Registered Parks and Gardens
- Zone of Theoretical Visibility
- Viewpoint locations

1. Footpath FP33 at the south-west corner of The Park
2. Footpath FP47 by the side of the railway
3. Footpath FP45 at the south east corner of Orsett Golf Club, next to Walnut Tree Cottages
4. Footpath junction FP60/FP61 next to East Tilbury
5. A126 between Tilbury and Chadwell St Mary
6. Footpath FP68 at Gun Hill, West Tilbury
7. Footpath FP200 near Buckland
8. Coalhouse Fort
9. Cliffe Fort
10. Bridge over the railway track on the west edge of Tilbury
11. Tilbury Fort
12. Corner of Thames Estuary Path near Wharves
13. Where Thames Estuary Path reaches the coast
14. Footpath junction NS138 behind Shorne Marshes Nature Reserve
15. Gravesend Town Pier
16. Footpath junction NS138/NS318 along Saxon Shore Way
17. Darenth Wood Road
18. Windmill Hill
19. Where footpath NS170 joins road at Brummelhill Wood
20. Footpath DR143 at edge of settlement near New Barn

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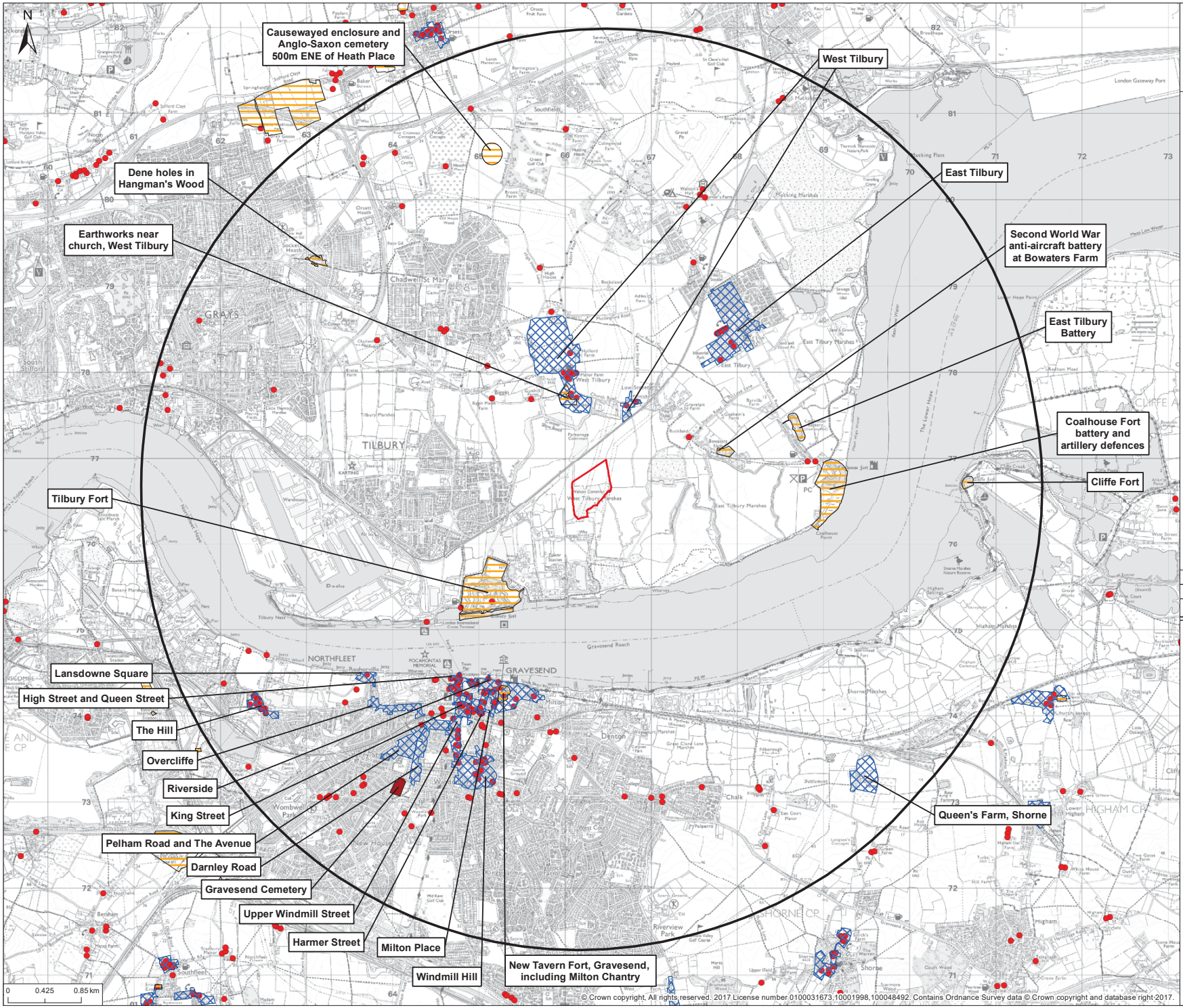
Client	Thurrock Power Ltd
Project	Thurrock Flexible Generation Plant
Title	Viewpoint Location Plan and ZTV

Status	Drawn By:	PM/Checked By
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Job Ref	**Scale @ A3**	**Date Created**
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Figure Number		**Rev**
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Legend

- Site location
- 5km study area
- Listed Buildings
- Registered Parks and Gardens
- Scheduled Monuments
- Conservation Areas

Rev	Description	Date	Initial	Checked

RPS
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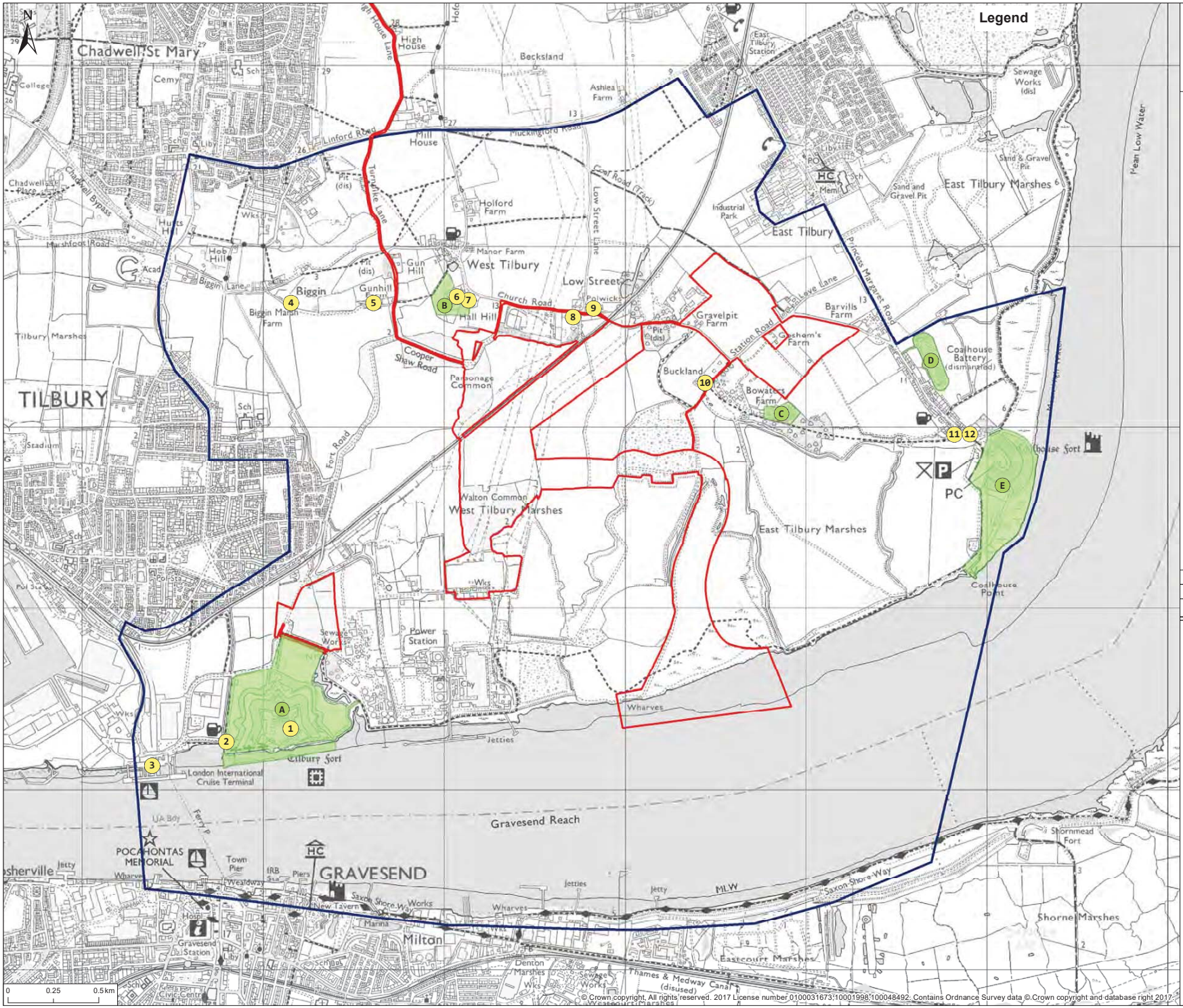
Client	Thurrock Power Ltd
Project	Thurrock Flexible Generation Plant
Title	Heritage Assets

Status	Drawn By:	PM/Checked By
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Job Ref	**Scale @ A3**	**Date Created**
OXF10872	1:42,000	JUL 2018
Figure Number		**Rev**
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Legend

- Development boundary
- 6 Historic Building
  1. Officers Barracks at Tilbury Fort - Grade II*
  2. Worlds End Inn - Grade II
  3. Riverside Station, including floating landing area - Grade II*
  4. Biggin Farmhouse - Grade II
  5. Gunhill Famrhouse - Grade II
  6. West Tilbury Hall and barn - Grade II
  7. Church of St James - Grade II*
  8. Walnut Tree Cottage - Grade II
  9. Polwicks - Grade II
  10. Buckland - Grade II
  11. Old Rectory - Grade II
  12. Church of St Katherine - Grade I
- C Scheduled Monument
  - A. Tilbury Fort
  - B. Earthworks near church, West Tilbury
  - C. Second World War anti-aircraft battery at Bowaters Farm
  - D. East Tilbury Battery
  - E. Coalhouse Fort battery and artillery defences

Rev	Description	Date	Initial	Checked

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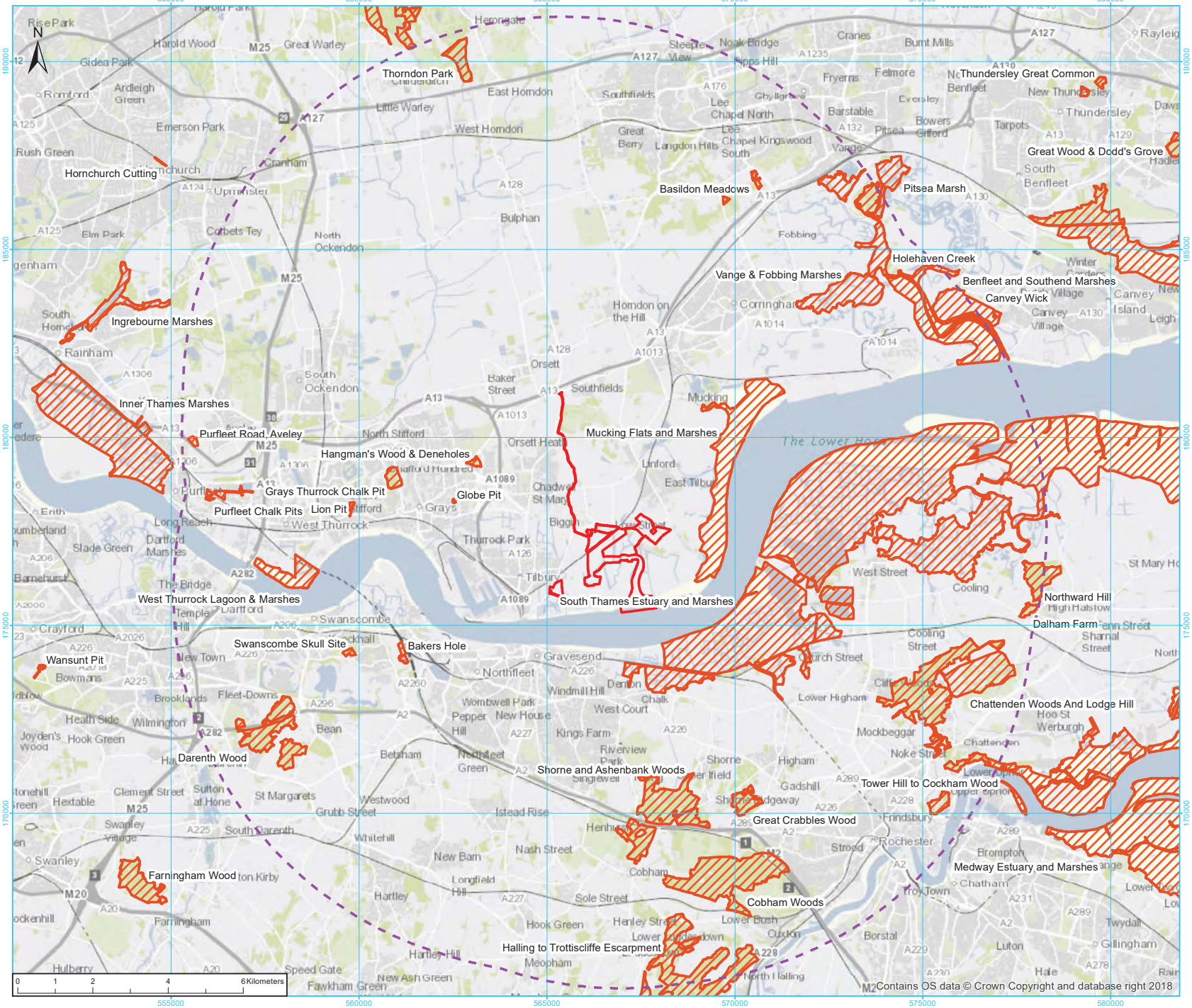
Client	Thurrock Power Ltd
Project	Thurrock Flexible Generation Plant
Title	Heritage Assessment Study Area

Status	Drawn By:	PM/Checked By
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OXF10872	1:20,000	JUL 2018
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Legend

- Development Boundary
- 10km from development boundary
- Site of Special Scientific Interest

Rev	Description	Date	Initial	Checked

RPS

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Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

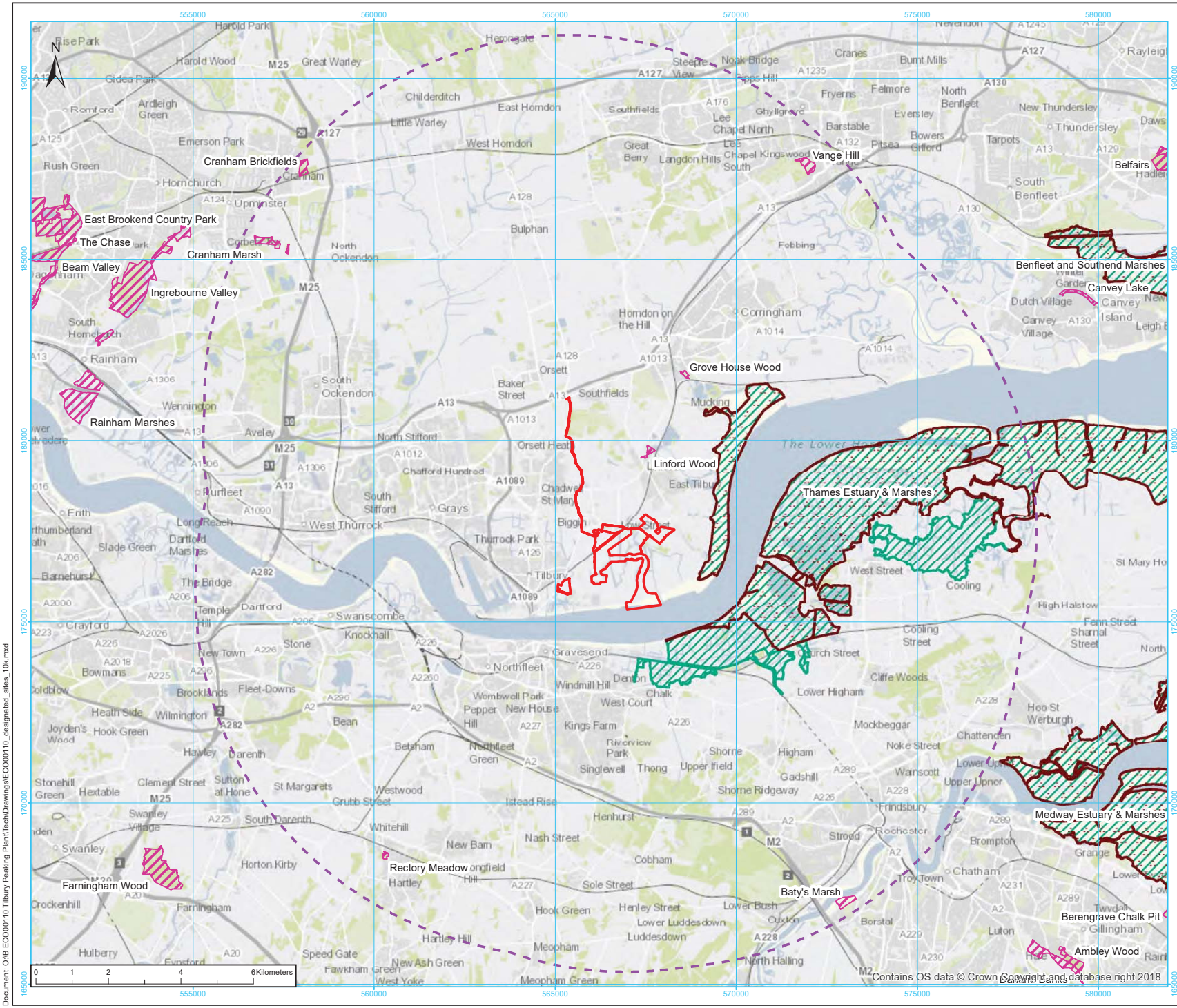
Project: Thurrock Flexible Generation Plant

Title: Sites of Special Scientific Interest within 10km of development

Status	Drawn By	PM/Checked By
Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
OXF10872	1:100,713	JUL 18
Drawing Number		**Rev**
Figure 12		B

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Legend

- Development Boundary
- 10km from development boundary
- Ramsar Site
- Special Protection Area
- Local Nature Reserve

Rev	Description	Date	Initial	Checked

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Client: Thurrock Power Ltd

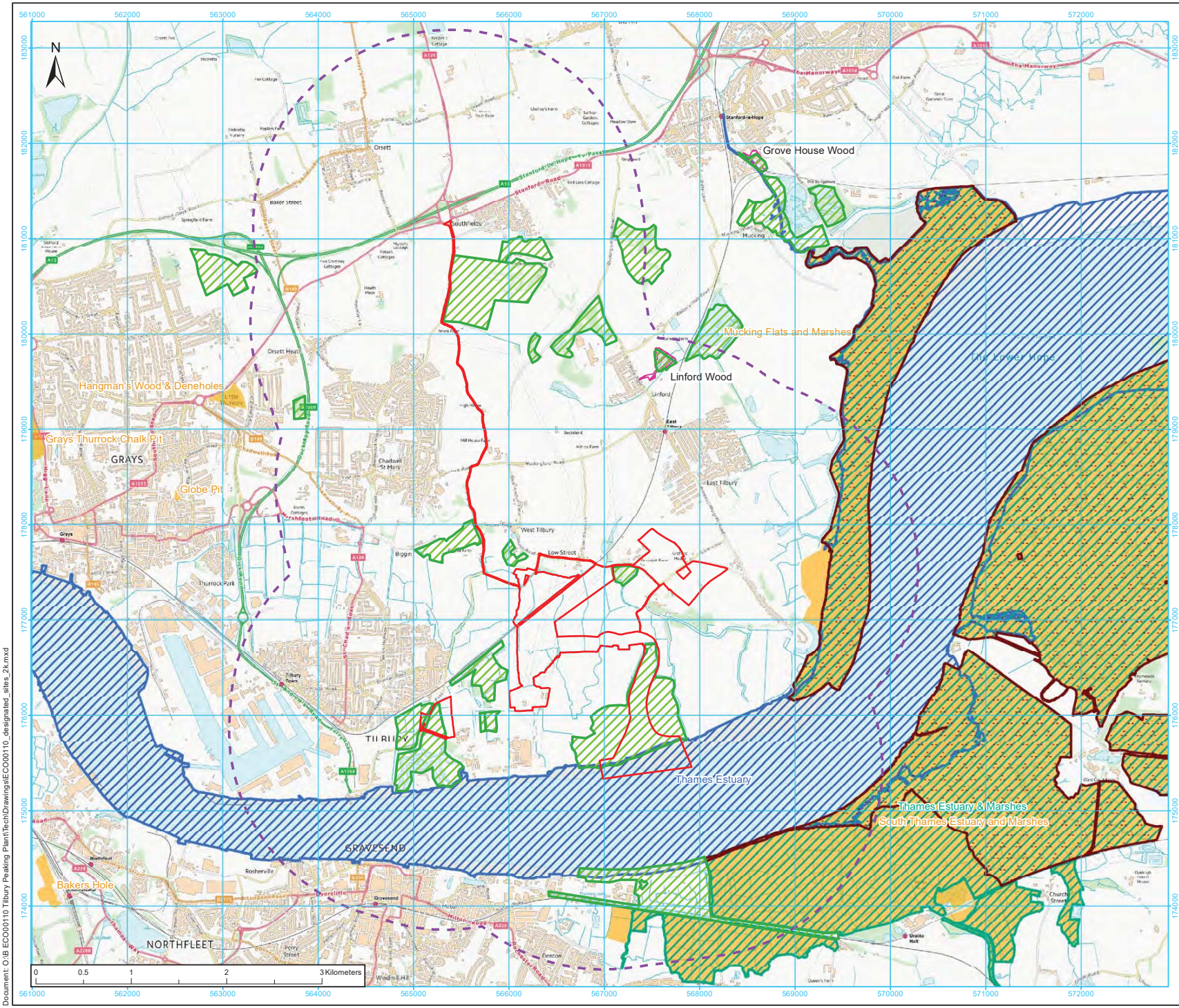
Project: Thurrock Flexible Generation Plant

Title: Designated sites within 10km of development

Status	Drawn By	PM/Checked By
Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
OXF10872	1:101,807	JUL 18
Drawing Number		**Rev**
Figure 13		B

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Legend

- 2km from development boundary
- Development Boundary
- Site of Special Scientific Interest
- Ramsar Site
- Special Protection Area
- Local Nature Reserve
- Local Wildlife Site
- Recommended Marine Conservation Zone

Rev	Description	Date	Initial	Checked

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Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

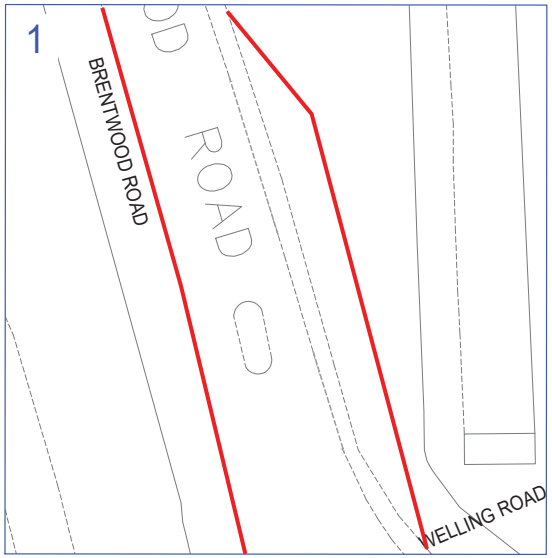
Title: Designated sites within 2km of development

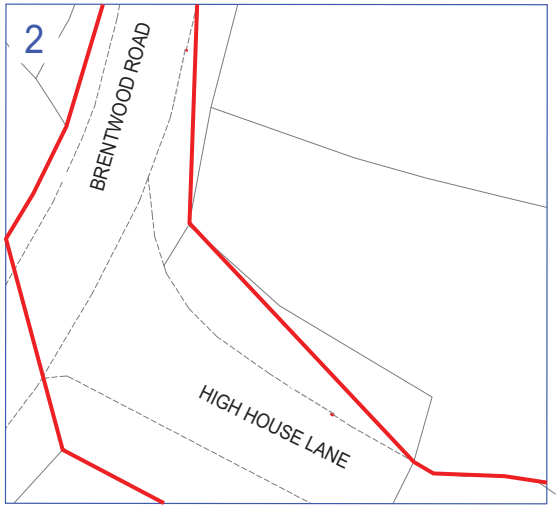
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Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
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Drawing Number		**Rev**
Figure 14		B

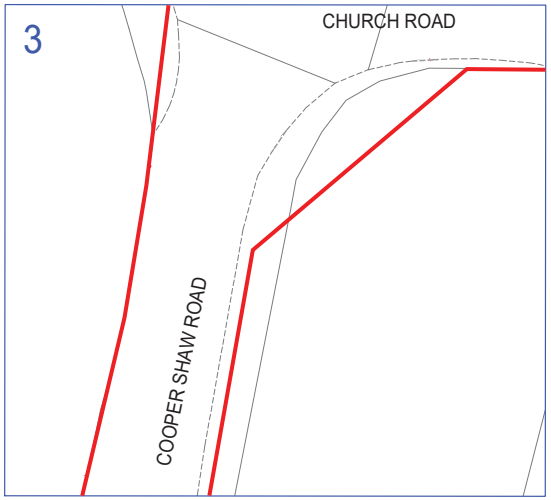
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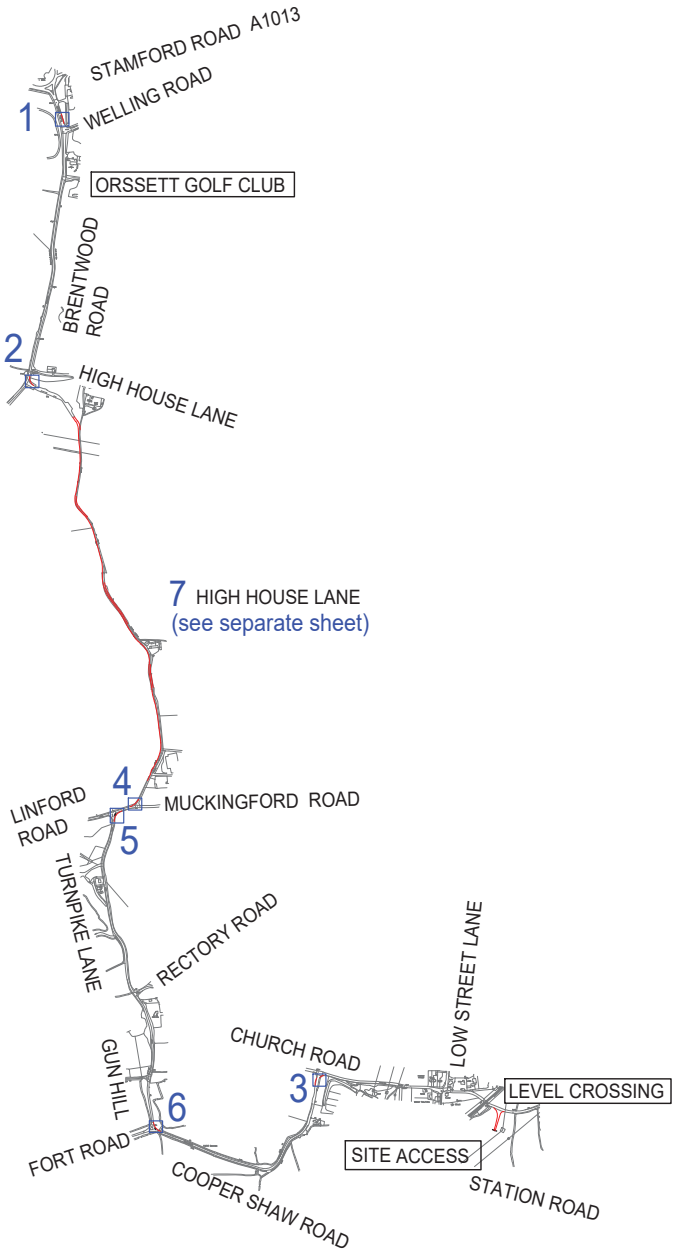
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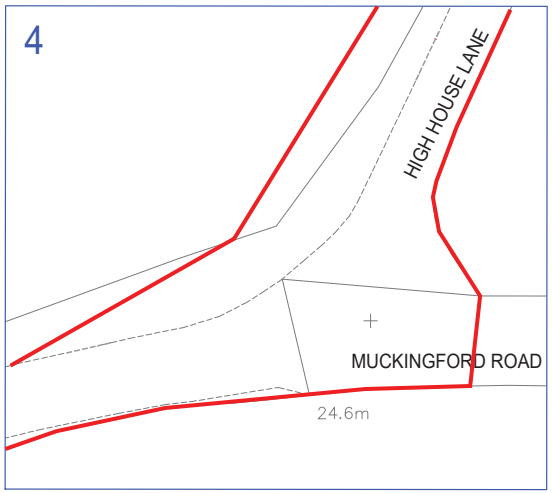
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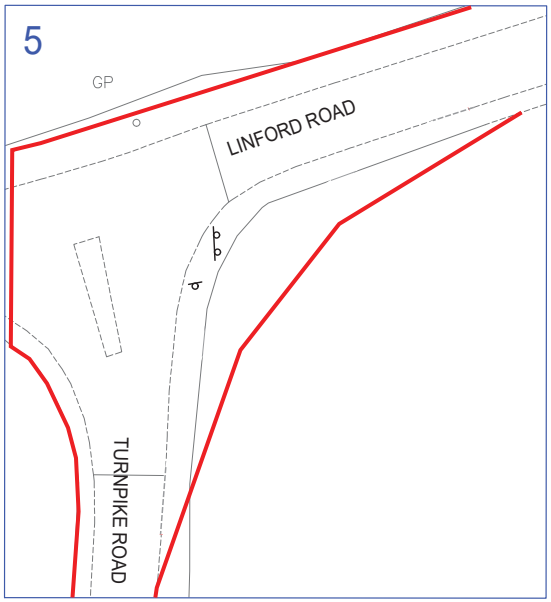


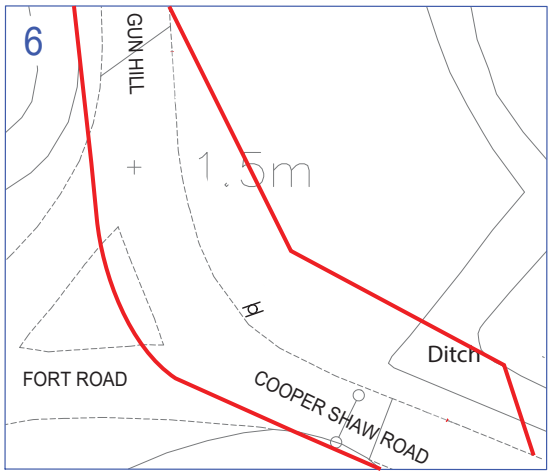












Extent of potential land take to widen the carriageway, relocate any signage, engineer any change in level and provide a margin for construction.

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Drawing: Land take for junction improvements to take an abnormal load

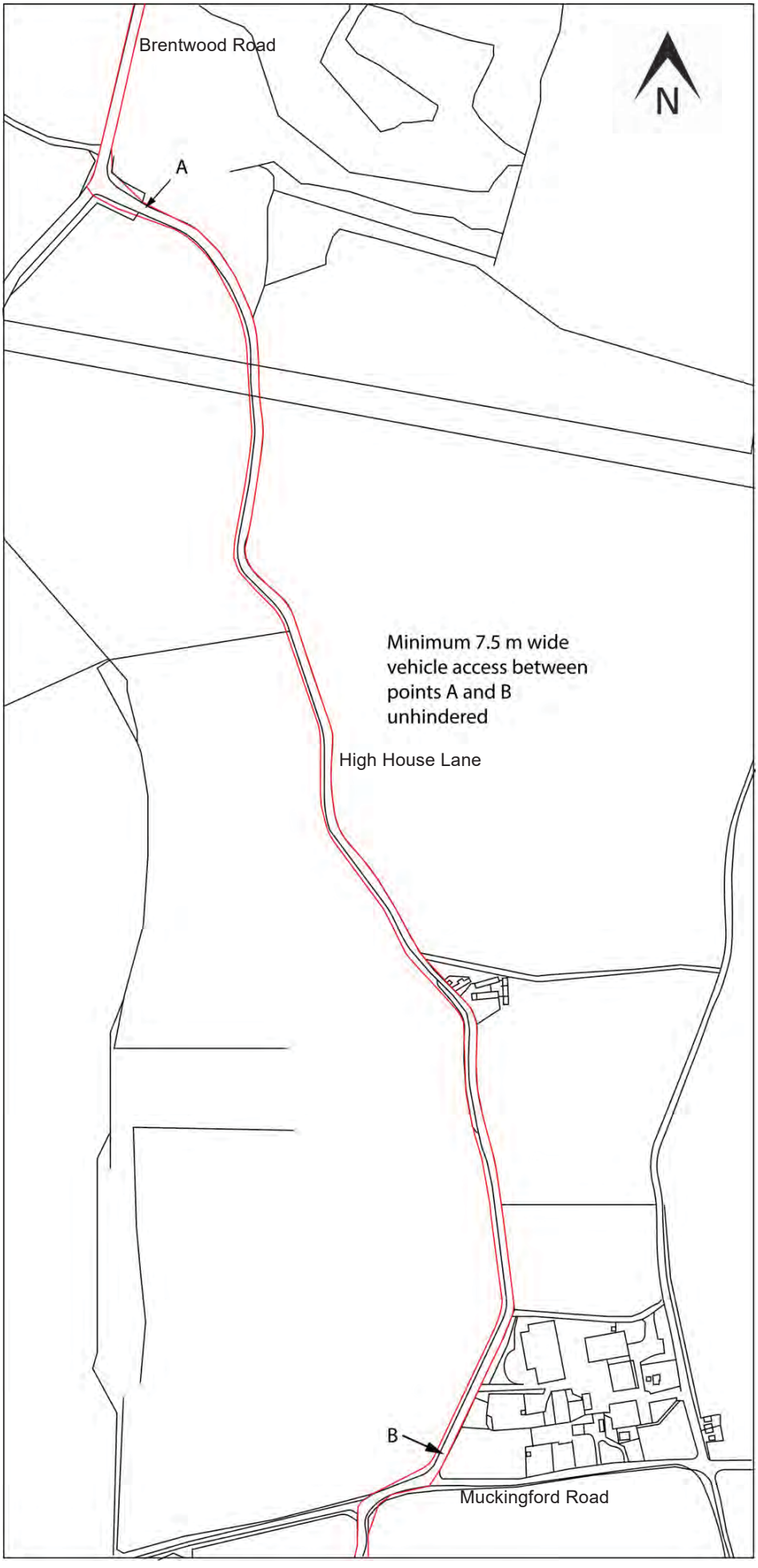
Drawing No: 273_AL_02

Figure: 15

Sheet: 1

Date: 30.04.18

Scale: 1:5000 @ A3



Extent of potential land take to provide access for an abnormal load

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Drawing: Land take for junction improvements to take an abnormal load

Drawing No: 273_AL_02

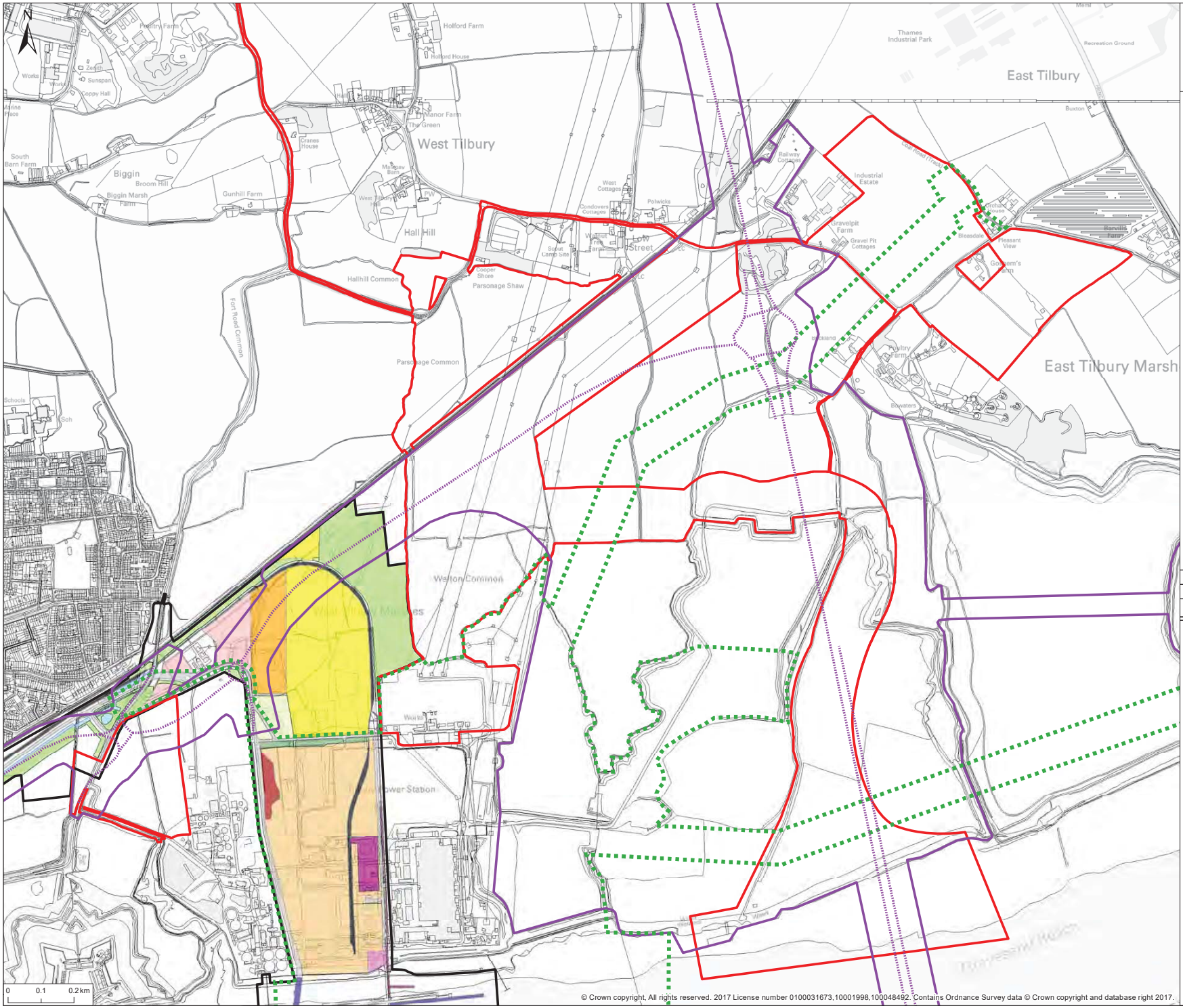
Figure: 15

Sheet: 2

Date: 30.04.18

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Legend

- Development boundary

Lower Thames Crossing

- Potential land required to construct and operate
- Indicative route alignment

RWE - Tilbury Energy Centre

- Indicative order limits

Tilbury 2

- Order limits
- Containers
- Jetty elements
- Proposed landscaping and ecological mitigation
- Proposed CMAT aggregates storage yard
- Proposed CMAT processing area
- Proposed RORO terminal workshop/admin/welfar/parking
- Proposed booking in queing area
- Proposed conveyor
- Proposed general storage
- Proposed open drainage
- Proposed silo and compound area
- Proposed warehouse
- Rail
- Retention of existing landscape
- Road

Rev	Description	Date	Initial	Checked

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Title	Potential major cumulative developments

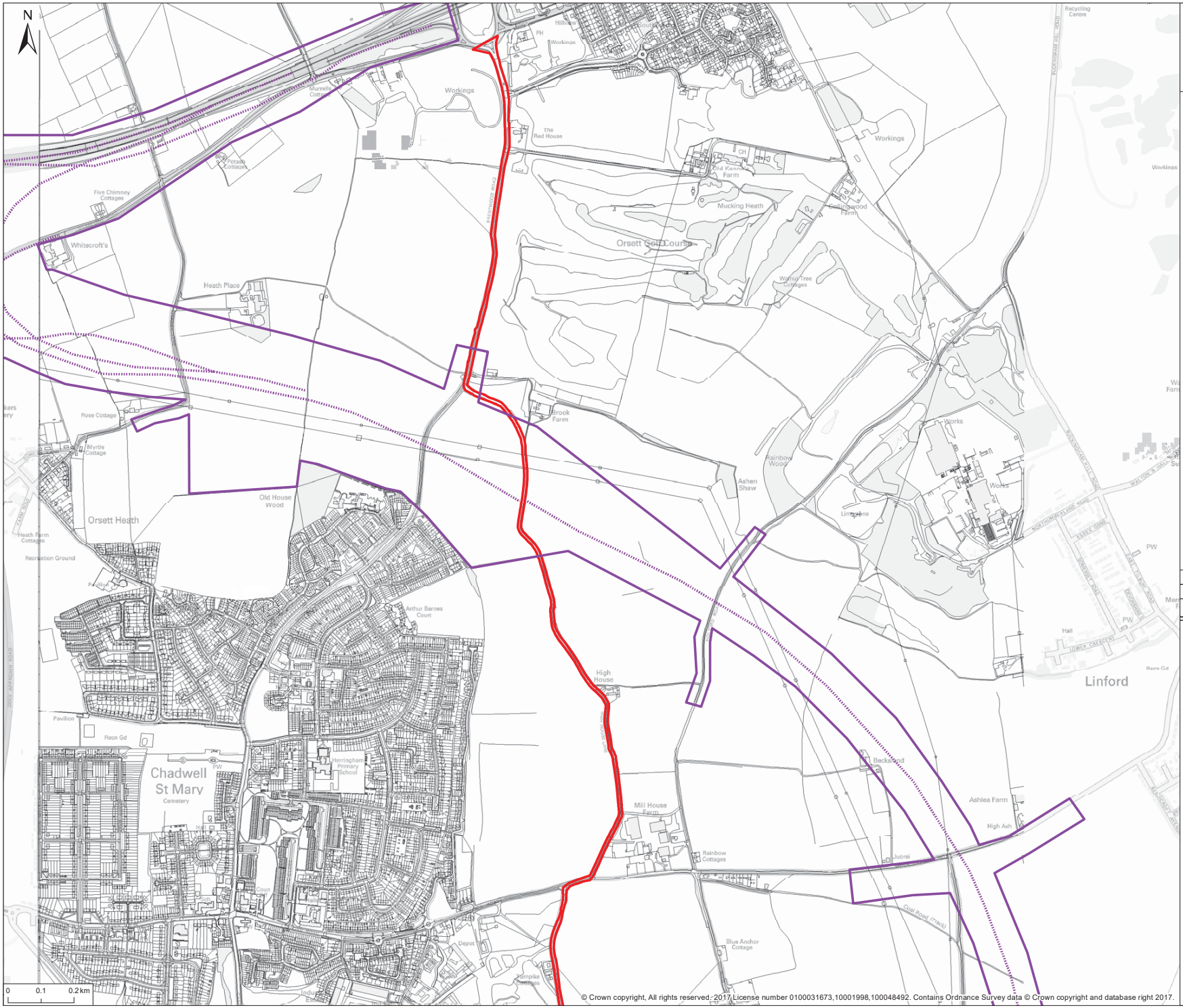
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Legend

- Development boundary

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- Potential land required to construct and operate
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Rev	Description	Date	Initial	Checked

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Appendices

Appendix A: Best Available Technology Assessment

Statera Energy – BAT Assessment

Tilbury Peaking Plant









Date: 14 February 2018

Our Ref: JAS9081

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Quality Management

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Date:	14 February 2018	
Revision:	2	
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Amendment Record

Revision No.	Date	Reason for Change	Authors Initials
0	06/12/2017	-	JS
1	15/01/2018	Further information from GE	JS
2	14/02/2018	Client comments	JS

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1 Introduction

1.1 Overview

1.1.1 This report provides a review of best available technology (BAT) for power generation during periods of peak demand for electricity in the UK. This so called peak reserve power generation capacity is reviewed in the context of a transitional phase from conventional fossil fuelled power generation typified by the progressive penetration of renewable power such as wind power, which is intermittent and inflexible baseload generation from CCGT and nuclear.

1.1.2 The current method for balancing the power market in Great Britain is to bring a new power station online at half capacity and to back another down, also to half capacity. The upside available margin created at the two power stations is then used to fill any requirements for increased generation in the market during peak hours (EnAppSys, 2017 [[1]]).

1.1.3 This can be successful in terms of balancing the market, but produces higher carbon emissions on start-up until the plants are operating at full load. These higher emissions are produced even when no additional balancing is required (which occurs frequently).

1.1.4 With the reduction in coal-fired and nuclear power stations and the move away from high carbon electricity generation, the UK is increasingly reliant upon renewable energy, principally that of wind, to cover the energy demand. This energy, however, is intermittent and is sometimes difficult to predict. In order to help safeguard the security element of the energy trilemma (security, cost, emissions), flexible energy generation is needed to ensure the demand for energy is met.

1.1.5 To a varying degree gas-fired power stations can provide this flexibility, being able to respond rapidly to fluctuations in supply in order to meet the necessary demand. This is largely because of the physical characteristics of gas, being a fluid (in contrast to coal) but also because of the simplicity of the chemical reaction involved. Although this is the case baseload generation from gas is mostly provided by combined cycle which has an inherent thermal inertia and takes time to ramp up to full load.

1.1.6 Statera Energy is proposing to develop and operate a 299.99 MWe peaking plant at its site in Tilbury, Essex. The facility will combust natural gas, generating electrical energy as required for supply to the national grid during periods of peak electrical demand. In order to operate the facility an Environmental Permit must be obtained from the Environment Agency and to secure the environmental permit the Operator needs to demonstrate that it will operate Best Available Techniques (BAT).

[1] Email from P Verrill, EnAppSys and A Troup, Statera Energy, 05 December 2017

1.1.7 This report has been prepared to demonstrate that the selected combustion technology represents BAT for serving the peaking market [2]. Three different technologies have been identified and their environmental performance compared to determine BAT for the Tilbury site.

1.2 Structure of the Assessment

1.2.1 The structure of the document is as follows:

- Section 2 contains a description of the methods used to assess the chosen parameters for this BAT assessment;
- Section 3 assesses the technical feasibility of each option to deliver the peaking plant duty required;
- Section 4 compares the environmental performance of each option;
- Section 5 discusses the implications of the previous sections with respect to BAT; and,
- Section 6 contains the conclusions concerning which technology is considered BAT for this site.

[2] Peaking market in this context implies limited hours operation to less than 1,500 hours per annum on a 5 year rolling average and also the ability to act as a fast reserve plant providing rapid and reliable delivery of active power.

2 Methodology

2.1 Selection of Combustion Technology

2.1.1 Combustion technologies available to perform the duty at the proposed peaking plant include reciprocating engines and gas turbines as set out below.

Gas Fired Reciprocating Engines

2.1.2 Reciprocating engine options comprise spark ignition reciprocating gas engine generator sets which are housed within concrete containers. Each gas engine has an air intake system, combustion chamber, an exhaust system and an electrical generator, together with common auxiliary plant.

2.1.3 Within the engines, gas and combustion air are ignited by means of a spark plug. As the burning mixture of fuel and air expands, a piston is pushed transferring energy released from combustion to an engine flywheel, from which a connected alternator is used to generate electricity.

2.1.4 Spark ignition engine combustion temperatures are low compared to other reciprocating engines, this means these engines result in lower NOx production.

2.1.5 BAT for reducing NOx emissions from reciprocating gas engines was determined by Amec Foster-Wheeler to be Enhanced Lean Burn (ELB)[3]. Lean burn combustion gas engines premix air into the fuel prior to ignition. This reduces the fuel:air ratio in the combustion chamber, creating an excess of oxygen required for combustion. The peak flame temperature in the piston is reduced, and a homogeneous temperature distribution is ensured, thus decreasing the amount of NOx formed. Enhanced lean burn systems are state-of-the-art lean burn combustion systems which can achieve <100 mg NOx [1, 4]. For all engine options lean burn technology is assumed to be included.

2.1.6 A range of reciprocating gas engines are available with electrical outputs of units being less than 20 MWe, consequently to provide the design electrical output a number of engines would be required. A range of reciprocating engine sizes have been considered within this assessment. There are other similar sized engines available which would have similar effects. All engine options would be designed to deliver circa 299.99 MWe output.

- Option 1: small engines (4.5 MWe and less)
- Option 2: medium engines (>4.5 MWe - <12 MWe)
- Option 3: large engines (>12 MWe)

[3] Department of Energy and Climate Change, Developing Best Available Techniques for Combustion Plant Operating in the Balancing Market. Final Report, March 2015

[4] Best Available Techniques (BAT) Reference Document for Large Combustion Plants, Final Draft, June 2016

Gas Turbines

2.1.7 There are three types of gas turbine available, heavy frame, industrial and aero-derivative and each can be configured to operate in open or combined cycle.

2.1.8 Gas turbines consist of a compressor, a combustion chamber and an expansion turbine. An air intake system extracts ambient air which is compressed to raise its pressure.

2.1.9 In the combustion chamber, fuel and compressed air are burnt at temperatures typically between 1,000 °C and 1,450 °C. After the combustion process, the gas expands through the turbine and generates electric power in the generator, drawing off the power needed to drive the compressors, or the shaft transferring mechanical power in the case of mechanical drive systems and with excess electricity being available for export. Exhaust gases containing waste heat not converted into mechanical energy are discharged directly to atmosphere.

2.1.10 Gas turbines can be operated in open cycle or closed cycle. Designs operating as above are categorised as Open Cycle Gas Turbines (OCGT). Combined cycle gas turbines (CCGT) have additional heat recovery steam generators (HRSG) and a steam turbine, which enable the generation of further energy from the exhaust heat produced by the process in the gas turbine. Exhaust gases are discharged to atmosphere, but at significantly lower temperatures compared to open cycle operation.

2.1.11 Amec Foster-Wheeler (2015) [3] stated that BAT for reducing NOx emissions from the combustion process of CCGTs or OCGTs firing natural gas is to use the following techniques:

- Wet low emissions (WLE) systems
- Dry low NOx (DLN) burners

2.1.12 WLE systems comprise water or steam being injected directly into the combustion chamber of the turbine. The subsequent evaporation of the water or superheating of the steam requires thermal energy, which limits the peak temperature of combustion and reduces the amount of NOx formed. The rate at which NOx levels are reduced depends upon the amount of steam or water injected.

2.1.13 DLN burners rely on the lean premixed combustion principle, which consists of fuel being mixed with air before it is ignited, achieving a lower peak flame temperature. It also ensures homogeneous distribution of temperature in the turbine. These conditions limit the amount of NOx formed.

2.1.14 This assessment has assumed that appropriate BAT for NOx control is included for the CCGT and OCGT options.

2.1.15 Both OCGT and CCGT units are available at a size to provide the design electrical output from installing a single unit. Both options have been considered as part of the assessment as follows:

- Option 4: 299.99 MWe OCGT
- Option 5: 299.99 MWe CCGT

2.2 Data input

2.2.1 Data were collected from three primary sources: discussions with suppliers; manufacturer brochures; and online research. Whilst data to inform this assessment has in some cases been based on a specific unit based on manufacturers' data, other designs are available at a similar size and performance would be expected to be similar. This assessment does not seek to tie the selected unit to a specific manufacturer's unit.

2.2.2 Discussions were conducted with General Electric (GE), MAN, Rolls Royce and Wärtsilä on the proposed options and what size units are available for a commercial operation at this scale. The three engine types discussed in this assessment include the largest engine considered available by two manufacturers and one smaller unit. It was highlighted that larger gas engines are not available; however there are larger reciprocating engines designed for container ships operating on diesel. These engines have not been considered within this assessment on the basis that they are not proven in use for gas fired peaking plant operation.

2.2.3 Where appropriate, manufacturers' brochures were obtained to provide further technical data.

2.2.4 For the reciprocating engines, GE Jenbacher data provided by Clarke Energy for the 4.5 MWe (small engine option) and 10.4 MWe (medium engine option) units were used to inform technical parameters, efficiencies and performance data. Wärtsilä provided data for the 18.4 MWe engine (large engine option) units. Whilst these options have been used for the quantitative analysis other engine options are available with similar performance. Efficiency data for the CCGT and OCGT options were based on a GE 9F.05 turbine. Emissions performance data was also obtained for the GE 9F unit alongside a review of data in the LCPD BREF. Again this data was taken as representative of turbines and it is recognised that there are other comparable turbines available from other manufacturers. This assessment seeks only to compare engine size and compare with open and closed cycle turbines, it does not seek to identify a specific engine/turbine or supplier as BAT.

2.2.5 To fill in data gaps, an internet search was carried out to acquire additional data for the gas turbine options for similar size plants. For the OCGT plant, an air quality assessment for the 299.99 MW peaking plant at Eggborough power station, North Yorkshire, was used to gather relevant data. The air quality assessment for the 350 MWe Lumcloon power plant in Co. Offaly, Ireland, provided necessary data for the 299.99 MWe CCGT plant.

2.2.6 The air quality assessments obtained via online research were used to obtain exhaust gas data for the OCGT and CCGT options.

2.2.7 CAPEX and OPEX data for all options were supplied by Statera.

2.3 Assessment

2.3.1 The assessment of the combustion technology has combined qualitative appraisal with quantitative assessment of the 5 options.

2.3.2 The options have been assessed against the following criteria:

- Ability to provide intended duty
- Emissions to air
- Energy efficiency
- Plume visibility

2.3.3 All options present the potential for noise effects, however it would be expected that each of the options would require some mitigation to achieve acceptable noise levels at sensitive receptors. On this basis overall noise effects are considered similar and therefore have been excluded from the assessment.

2.3.4 The main raw material used is natural gas in all instances. Consequently there would be no significant odour effects from all options. Odour has therefore not been considered.

2.3.5 All options involve the delivery and combustion of natural gas and ancillary storage of lubricating oil and waste oil. The risk of accidents for all options is therefore considered to be similar and therefore is not considered relevant to this options appraisal.

2.3.6 All options will generate relatively little waste and consequently waste generation has not been included within the options appraisal.

2.3.7 A qualitative appraisal has been applied to assessing the suitability of each option for meeting the supply tariffs that the peaking plant will target.

2.3.8 The H1 tool [5] was used to conduct a quantitative options appraisal of emissions to air and to establish annualised costs for each option.

2.3.9 The scope of the assessment considered the relative impacts from emissions to air for each of the 5 Options.

[5] The H1 tool is an EA software application which is designed to undertake environmental risk assessments and options appraisals for the purpose of Environmental Permit Applications. Guidance and details on how to obtain the software can be found at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

3 Ability to Perform the Intended Duty

3.1.1 It is clearly essential that the selected technology is able to both perform the intended duty and be commercially proven in order to secure finance for the development. It is highly desirable for multiple manufacturers to be able to supply the units to ensure a competitive tendering process and manage project financing risks and ultimately the deliverability of the scheme.

3.1.2 The UK energy mix is seeing increased penetration of renewables, a deployment rate which will increase in the coming years. At the same time, coal and old nuclear plant continue to close and new build nuclear will take time to replace this lost baseload capacity from the generation mix. This depleted and inflexible baseload combined with the variable output of renewables, principally wind and solar, requires flexible generation to provide peaking load to provide power at times when renewable generation is not generating a substantial output because of low wind speeds or low irradiance. The need for flexible generation will become increasingly important as times of system imbalance become more difficult to predict. This position will be further exacerbated with the mass electrification of transport. The ability of plant to ramp up and down the more efficient it is in the balancing system, hence reducing costs to the consumer.

3.1.3 An evaluation of the technical availability of the Options is made against the following criteria:

- Available at commercial scale and with multiple manufacturers available
- Start-up time
- Maximum turn down
- Plant availability

3.1.4 Data for the 5 options considered are provided in Table 3-1 below.

Table 3-1 Availability and Operational Performance Criteria

Option	**1** **Small Engines**	**2** **Medium Engines**	**3** **Large Engines**	**4** **299.99 MWe OCGT**	**5** **299.99 MWe CCGT**
Available at Commercial Scale	Yes	Yes	Yes	Yes	Yes
Multiple Manufacturers Available	Yes	Yes	Yes	Yes	Yes
Start-up Time	2	3	5	20	30 10*

Option	1 Small Engines	2 Medium Engines	3 Large Engines	4 299.99 MWe OCGT	5 299.99 MWe CCGT
Minimum Turn Down	1.35 MWe	3.12 MWe	5.5 MWe	104.65MWe	137.5 MWe
Operational Availability	94 %	94 %	94 %	94 %	93 %

* Start-up time from warm for a fast start aero-derivative CCGT, start-up time from cold is broadly similar to that for a conventional CCGT.

3.1.1 In order to finance the scheme it is critical that the technology is proven for the duty and available from multiple providers to maintain price competition.

3.1.2 Turn down is a function of the operational flexibility of the plant to operate within emissions performance.

3.1.3 The availability of all options is good and similar availability is achieved with all options, albeit CCGTs slightly lower. Given the similar performance of all options availability is excluded from further consideration as part of this assessment.

3.2 Gas Engines

3.2.1 The gas engines are characterised by short start-up times enabling this technology to respond quickly to meet peak demands for electricity. Since the gas reciprocating engines can start-up times in 2-5 minutes and run for 1 or 2 minutes they can be used to provide upwards generation as required, without the need to back down large power stations to well below the optimal output (EnAppSys, 2017 [1]).

3.2.2 The BAT review for peaking plant by Amec Foster Wheeler [3] identified that the operating profile of a balancing plant as an important consideration in determining BAT and short-term operation of engine technologies with associated short start up times can be capitalised upon for plant providing fast start duties.

3.2.3 All engine options will comprise a solution with multiple units installed to deliver the maximum output. This presents operational flexibility to supply electricity at demands below the maximum output by reducing the number of engines in operation rather reducing load with associated impact on plant performance e.g. efficiency. Clearly the smaller the engine the greater this flexibility and this is reflective of the data provided by manufacturers as summarised in Table 3-1.

3.2.4 For the small and medium engine size there are multiple manufacturers available including GE Jenbacher, Siemens, Wärtsilä, MAN and Rolls Royce. The supply chain for the larger units is more limited and includes Wärtsilä and MAN.

3.3 Gas Turbines

3.3.1 There are three types of gas turbine available, heavy frame, industrial and aero-derivative and each can be configured to operate in open or combined cycle. Of the three types of turbines available the aero-derivative design can achieve fastest start-up time.

3.3.2 OCGTs have lower ramp-up rates resulting in start-up times of around 20 minutes. These units are considered suitable for mid-merit operation, but would not satisfy the fast start market.

3.3.3 Conventional CCGT designs have ramp up times of approximately 30 minutes from hot and for some plant cases taking longer than 90 minutes. Clearly these units are unsuited to this peaking application as by the time the unit is at full capacity the requirement may have gone.

3.3.4 It was reported during a meeting with the EA [6] that there may be CCGT units operating within the USA providing fast start peaking plant duty using aero-derivative CCGT technologies. Discussions with both UK suppliers (see section 2) and internet research have not identified commercially operational peaking plant using this technology in the UK. References to a CCGT in the US have been reviewed including the Salem Massachusetts facility and the Cane Run Generating Station.

3.3.5 The Salem Massachusetts facility using GE FlexEfficiency 60 technology is reported to have fast start capability [7, 8] and whilst this facility can ramp up to provide up to 300 MWe (i.e. 50% load) in circa 10 minutes this is not from cold and to get to full load takes significantly longer. The Salem plant is turned down outside of peak hours. Whilst this CCGT has significantly reduced ramp-up times it still falls short of serving the fast response times for some service contracts required by National Grid and which form part of the services being targeted by Statera. It would also appear that the fast start duty is achieved at an output of only 50% of the full load and not when operating in CCGT mode. It is therefore concluded that even this advanced CCGT technology cannot provide a fast start duty and enable electricity export within < 5 minutes to be achieved. GE data on the FlexEfficiency 60 CCGT indicate that full loads are achieved in 30 minutes (from hot).

3.3.6 The Cane Run Generating Station in Louisville, Kentucky is a 640 MW natural gas CCGT and comprises two SGT6-5000Fee gas turbines from Siemens, a Siemens SST6 5000Fee steam turbine and heat recovery steam generator (HRSG) from Vogt Power International. Marketed as a fast start CCGT plant [9] the plant does achieve start times significantly lower than conventional CCGTs but again at 10 minutes this plant is significantly slower than that

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[6] Meeting between Environment Agency (Richard Chase, John Henderson), Statera Energy (A Troup, Simon Johnson) and RPS (Jennifer Stringer) held 30 August 2017.

[7] Commonwealth of Massachusetts Energy Siting Board, Final Decision, 10 October 2013

[8] http://www.power-technology.com/projects/salem-harbour-combined-cycle-gas-turbine-power-plant-massachusetts/

[9] http://www.power-eng.com/articles/print/volume-121/issue-3/features/fast-start-combined-cycles-how-fast-is-fast.html

achievable using gas engines. It would also appear that again the fast start duty is achieved at an output of only 50% of the full load and would not support meeting fast-start duty falling short of the ability to export electricity in less than 5 minutes.

3.3.7 Based on the above it would appear that to provide a fast-start CCGT solution, the CCGT would need to be designed at double the capacity so that at 50% load it would deliver the required electrical output, i.e. a circa 600 MWe CCGT would be required to deliver the design 299.99 MWe output for the Tilbury plant.

3.3.8 GE has supplied information on the performance of aeroderivative turbines in their portfolio. Reference is made to this in subsequent sections of this document. It would appear that GE's aeroderivative turbines are operated in simple cycle mode to achieve fast start times with associated reduced efficiency when operated in this mode. Start times of circa 10 minutes are achievable. It should be noted that although the turbines are capable of start-up on 5 minutes this would be limited to only 4 starts per annum (to avoid thermal fatigue) and therefore is not considered a commercially available duty. Combined cycle operation using these turbines is possible but start-up times are extended.

4 Environmental Performance

4.1 Emissions to Air

4.1.1 The primary emission to consider from combustion of gaseous fuels is nitrogen oxides (NOx). For the five options considered all can achieve the required emissions limits via primary controls and without the need for secondary abatement.

4.1.2 Emissions performance data for each of the Options is summarised in Table 4-1 below. It is important to note that process contribution data is based on the output from H1 which provides a highly conservative assessment for the purpose of screening effects and therefore should only be used for comparing the relative performance of the options. It is usual for modelled process contributions to be considerably lower. Detailed modelling would be required for all 5 options.

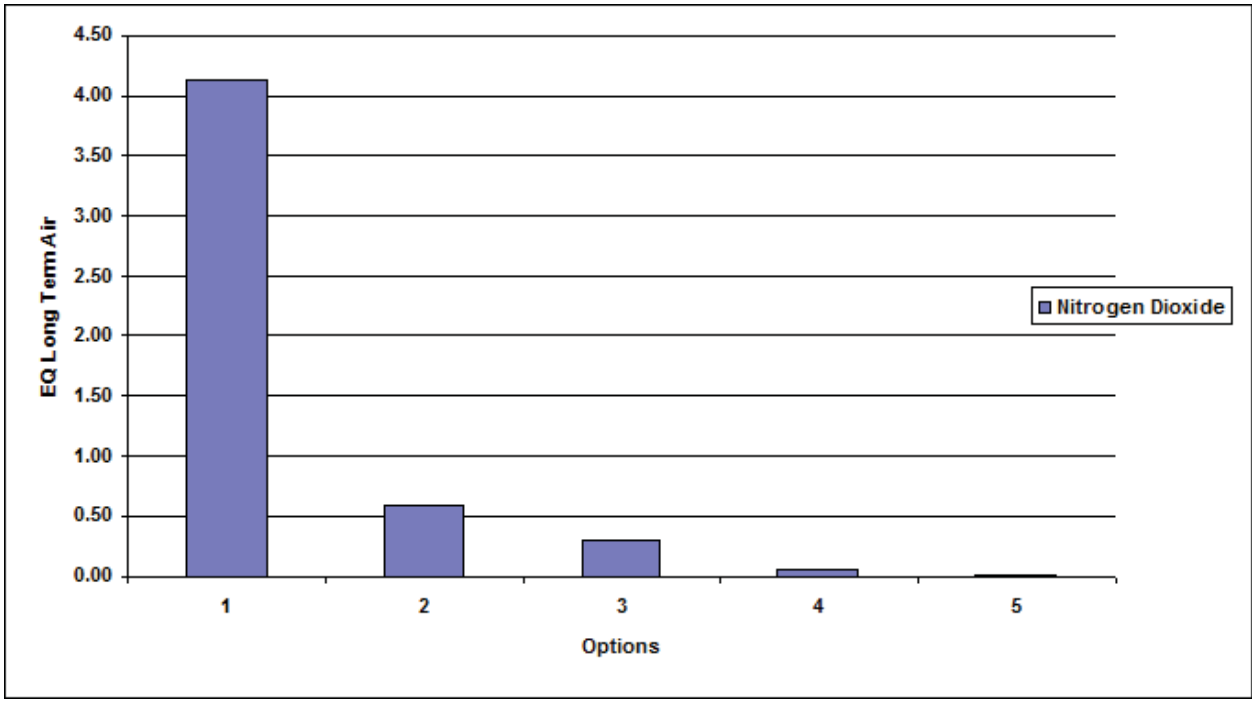
Table 4-1 Emissions performance

Option	**1 Small Engines**	**2 Medium Engines**	**3 Large Engines**	**4 299.99 MWe OCGT**	**5 299.99 MWe CCGT**
Legislative emissions concentrations (mg/Nm^3)					
NO_2	95	75	75	50	50
Achievable emissions concentrations (mg/Nm^3)					
NO_2	95	74	74	25	25
Short term % Process Contribution (PC) of Environmental Assessment Level (EAL)					
%PC/EAL NO_2	9,747	2,632	1,569	691	187
Long term % Process Contribution (PC) of Environmental Assessment Level (EAL)					
%PC/EAL NO_2	412	58.8	29.3	5.67	1.51
Annual Mass Emissions (tonnes per annum)[1]					
NO_2	284	235	217	87	25

(1) Mass emissions based on max 5 year rolling average hours at 1,500 hours per annum.

4.1.3 Figure 4-1 shows the estimated long term effects in terms of total EQ of nitrogen dioxide for each option.

Figure 4-1 Air Long Term Effects – Total EQ by Option



4.1.4 Based on the H1 screening assessment:

- Option 1 has the highest long and short term effects from air emissions
- Option 5 (CCGT plant) has the lowest long and short term effects
- Comparatively there is not as great a difference between the total EQ of Options 2 – 5 as there is between those four options and Option 1.

4.1.5 Selective Catalytic Reduction (SCR) can be applied to combustion plant to reduce NOx emissions. For the technologies considered in this report SCR has been deemed unnecessary. However the proposed plant at Tilbury will be designed to accommodate SCR should future legislation or other drivers require the units to achieve reduced NOx emissions. With SCR the engine options can be designed to achieve lower NOx emissions and depending on the SCR design performance below turbine emission limits and approaching the achievable performance for the turbine can be achieve. Data from GE indicates SCR applied to gas engines can be designed to achieve NOx levels of 93 mg/Nm^3 (only applicable for MCPD engines) down to 28 mg/Nm^3 with typical designs within this range set to achieve 37 mg/Nm^3, 56 mg/Nm^3 and 74 mg/Nm^3. It should be noted that whilst NOx reductions are achieved the potential ammonia slippage and releases from the stack associated with reagent injection are introduced. The Amec Foster Wheeler report [3] reviewed studies on the performance of abatement concluding that SCR requires a long period of time to reach its

optimum operating temperature and abatement efficiency after start-up (15-46 minutes). The outcome of this review concluded that SCR was not BAT for plant operating in the peaking market. SCR technology is constantly improving and evolving, and discussions with technology providers suggest that SCR can now be effectively used for a peaking plant with start-up times as short as 2 minutes from hot increasing to up to 15 minutes from cold. However as identified by the Amec Foster Wheeler report, SCR is characterised by high capital costs and increased operating costs and until such times that it is considered proven in the peaking plant market it is considered that the conclusions of the Amec Foster Wheeler report stand and SCR is not BAT for peaking plant at this time.

4.1.6 For Option 5 the CCGT assessment has been based on a standard CCGT design which can achieve low NOx levels without the need for end of pipe abatement. For fast-start CCGT designs (both with the Siemens and GE designs) SCR has been installed in the US plants, although it is possible that this is driven by the need to control start up emissions as limits are applied in some States in the US. As with engines, the use of SCR within a CCGT would introduce the potential of ammonia slippage and associated emissions to air. It is also noted that some fast-start CCGTs only achieve 50% load within 10 minutes suggesting that the CCGT would need to be double the size to meet the same performance as an engine and therefore associated emissions would be doubled (see paragraphs 3.3.5 and 3.3.6).

4.1.7 All turbines (OCGT and CCGT) have a Minimum Environmental Load (MEL) below which emission limits will not be achieved. Typical standard turbine designs have a MEL around 30-40% although some designs are now reported as having a MEL as low as 25%. In this respect the engines offer greater operational flexibility to deliver required loads and operate within design emission performance. Individual engine units will have similar achievable minimum environmental loads with 25% readily achievable with engines controls, but compressed start-up times would mean operation above emission limits would be significantly reduced. The long-term emissions performance for turbines presented in this assessment has assumed turbine emissions well below the ELV set within the IED. When operating at lower loads the emissions performance as presented would not be achieved with emissions permitted up to double that assumed in this assessment whilst still operating within emission limits (i.e. 2 x 299.99 MWe units).

4.1.8 Start-up curves for the GE 9F Turbine and a GE fast start aeroderivative gas turbine (LM6000PF Sprint) are provided in Figures 4-2 and 4-3 below and illustrate typical emissions performance during start-up for these units.

4.1.9 It is noted that the LM6000 can achieve a fast start-up of 10 minutes from cold but this is achieved in simple cycle mode with associated reduction in efficiency.

4.1.10 For the GE 9F model emissions below gas turbine emission limit values are achieved at circa 19 minutes whilst for the LM6000PF turbine this reduces to circa 7.5 minutes. Further compliance with the higher emissions limits applicable to reciprocating engines are achieved

only marginally quicker at around 17 minutes for the GE 9F turbine and 7.3 minutes for the LM600PF.

Figure 4-2 Predicted NOx and CO performance during start-up for the GE 9F Turbine

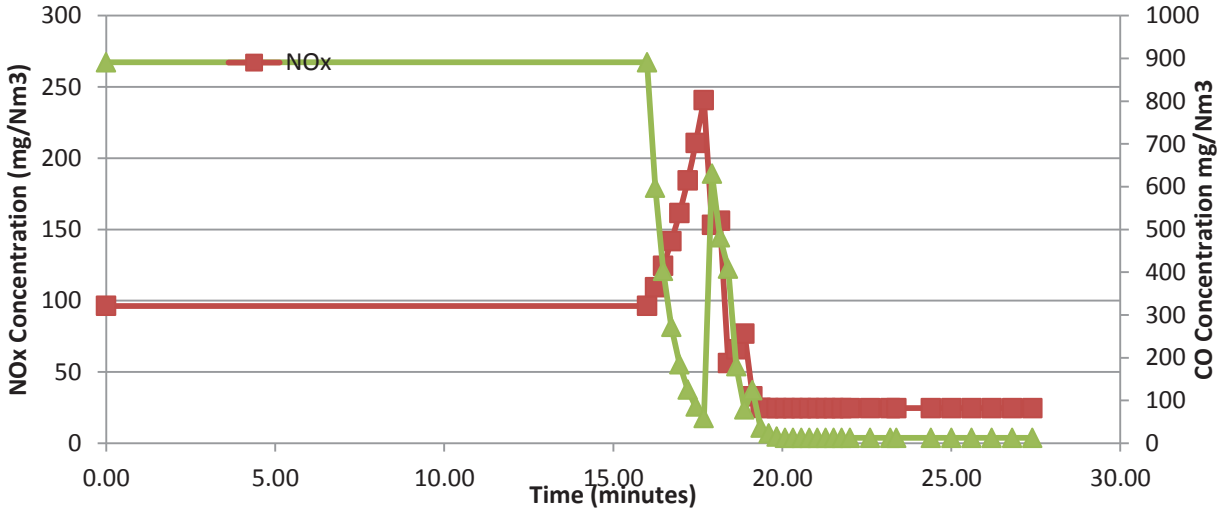
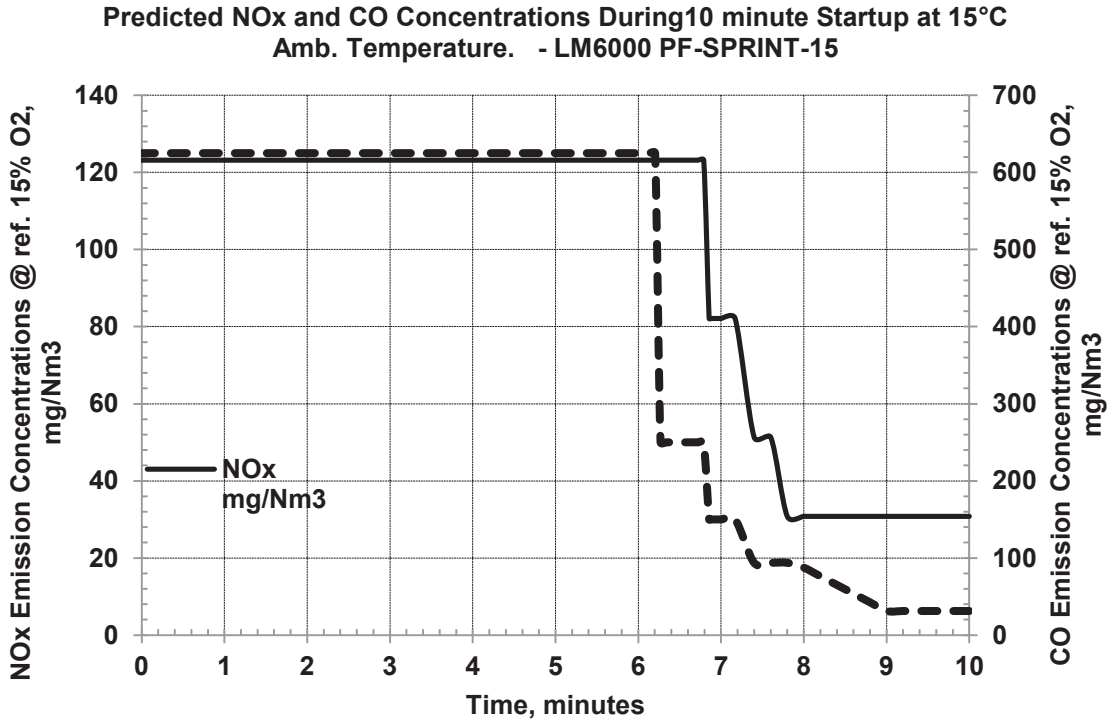


Figure 4-3 Predicted NOx and CO Concentrations During 10 minute Startup LM6000 PF-SPRINT-15



4.1.11 For engines with start-up emissions vary depending upon start-up times. Compared to fast start turbines with a start-up tome of 10 minutes a reciprocating engine operated in a similar manner would have lower overall mass emissions of NOx over this period.

4.2 Plume Visibility

4.2.1 The exhaust gases released from all three gas engine options and the OCGT would be at relatively high temperatures (i.e. 325-350 °C for the engines and circa 550 °C for the OCGT). Typically this eliminates any visible plume from the exhaust stack.

4.2.2 This contrasts with CCGTs which emit lower temperature exhaust gases (because of heat recovery) at around 95 °C. A plume from water vapour condensation is often visible under certain low temperature meteorological conditions.

4.3 Energy Efficiency and Global Warming Potential

4.3.1 A comparison of electrical efficiencies for each option is shown in Table 4-2 below.

Table 4-2 Efficiencies from the different combustion unit options

Option	Electrical Efficiency (%)**	
	Typical	Maximum
1: Small Engines	45.1	45.1
2: Medium Engines	47.8	49.9
3: Large Engines	47.9	48.5
4: 299.99 MWe OCGT	38.2	38.7
5: 299.99 MWe CCGT *	60.2	60.5

* Efficiencies reduce to ~39-43 % when operated in OCGT mode e.g. to achieve fast start up.
** ISO efficiency when new.

4.3.2 The electrical efficiencies in Table 4-2 are above the minimum BAT-associated energy efficiency levels (BAT-AEELs) for each type of combustion unit and with the reciprocating engine efficiencies given in Table 4-2 actually being higher than the maximum BAT-AEEL of 44% stated for gas engines.

4.3.3 The above efficiencies are for operation at full. For CCGTs, efficiencies as presented are for conventional CCGT plant and fall below 50% when operating at anything less than 65% of the full load. OCGTs operating at half load, the efficiency can drop below 30% [[10]].

4.3.4 The efficiency of the engine options will similarly drop if operated at part load, but efficiency effects based on manufacturers' data sheets only reduce typically by 3-5%. With multiple engine units in place for options 1—3 the reciprocating engines can provide the flexibility to only operate the number of units required for the specific peaking demand to be met, and therefore keeping the operational units at high efficiency, avoiding the need to operate units at part loads with lower efficiency.

[10] https://www.wartsila.com/energy/learning-center/technical-comparisons/combustion-engine-vs-gas-turbine-part-load-efficiency-and-flexibility

4.3.5 The efficiency performance for the options considered will be directly proportional to its associated global warming potential (GWP). The primary GWP associated with all options will be associated emissions of carbon dioxide (CO_2) resulting from combustion of the natural gas, for a given electrical output the more efficient the option the less gas used and the lower the associated GWP.

5 Discussion

5.1.1 The options considered within this assessment have been ranked in terms of their relative performance in Table 5-1 below. The total scores are applied on a simplistic basis and without any weighting, i.e. all factors considered are assumed to be of equal importance.

Table 5-1 Ranking

Option	**1 Small Engines**	**2 Medium Engines**	**3 Large Engines**	**4 299.99 MWe OCGT**	**5 299.99 MWe CCGT**
Technical Considerations					
Ability to Provide Intended Duty	1	1	1	4	5
Sub-Total	*1*	*1*	*1*	*4*	*5*
Environmental Considerations					
Air Quality Effects	5	4	3	1	1
Plume Visibility	2	2	2	1	5
Energy Efficiency & GWP	4	2	2	5	1*
Sub-Total	*11*	*8*	*7*	*7*	*7*
Total	**12**	**9**	**8**	**11**	**12**

* Ranking applies to conventional CCGTs; fast start aero-derivative turbines operating in open cycle achieve efficiencies below those of the engines leading to a ranking for this option of 4 and promoting the engines to 1 for Options 2&3 and 3 for Option 1.

5.1.2 Overall, based on the rankings above Option 3 has the best performance having the lowest overall score and highest ranking in its ability to provide the intended duty as well as having the top environmental ranking (along with the CCGT and OCGT option). Option 2 also performs well with only a small difference in overall performance (1 point) between that of Option 3.

5.1.3 Whilst in simplistic terms this would lead to the conclusion that Option 3 closely followed by Option 2 represents BAT, arguably air quality and energy efficiency/GWP could be considered as warranting a higher priority than visual impact associated with plumes from the stack. For these environmental criteria the CCGT option has the highest ranking, but this is

only achieved assuming the CCGT is operating at its maximum efficiency. This is only really achieved as operation approaches full load and there is a high possibility of operation closer to that achieved by engines. For fast start turbines efficiencies are lower than all engine options due to operation in open cycle. In addition the assessment has not considered the higher emissions at start-up and shutdown. As a consequence the assessment presents an optimistic picture of the environmental performance of the CCGT. It is also relevant that the engine options would also exhibit elevated emissions during start-up, but when compared on a similar basis start-up emissions would be better than those for CCGTs. The engines are also much more likely to run close to or at the efficiencies stated. When these factors are taken into account, it is considered that the environmental performance of CCGTs is no better than that of engines when operating in peaking duty.

5.1.4 A further consideration for each option is cost.

5.1.5 The estimated costs associated with each option are presented in Table 5-2. In order for direct comparisons to be made, the costs are presented as annualised costs, spread over a 25 year lifetime with a discount rate of 10% assumed for all options.

Table 5-2 Costs

Option	CAPEX	OPEX	Present value cost of option	Equivalent annual cost of option
1: Small Engines	£92,000,000	£4,350,000	£131,485,124	£14,485,463
2: Medium Engines	£100,000,000	£4,350,000	£139,485,124	£15,366,807
3: Large Engines	£100,000,000	£4,350,000	£139,485,124	£15,366,807
4: 299.99 MWe OCGT	£130,500,000	£4,350,000	£169,985,124	£18,726,934
5: 299.99 MWe CCGT	£187,500,000	£7,560,000	£256,122,422	£28,216,514

5.1.6 As noted earlier the fast start CCGT designs would require a facility twice the size to deliver the electrical output within 10 minutes. Costs have not been provided specific to this type of technology but assuming a similar cost to a more standard CCGT (this is likely to be a low estimate of actual cost [9]) then capital costs would be roughly double and Opex would also increase, albeit with some efficiencies expected for multiple units but with operational and maintenance costs again reported to be higher for fast start CCGT plants than those for conventional plant [9].

5.1.7 CAPEX, OPEX, net present value and equivalent annual cost for a conventional CCGT are close to double that of the smallest engines and clearly from the information presented in section 3, is not a realistic option to deliver peaking power duty. For a fast start CCGT option this would be 3-4 times more expensive and would not achieve some of the environmental or efficiency benefits presented in this assessment.

5.1.8 OCGT costs are closer to that of the engine options. Whilst the emissions performance of an OCGT under normal operation exceeds that of the engines plant efficiencies are lower. In the event of a requirement to operate at reduced load, efficiencies would drop further. Start-up times are significantly longer than that for engines providing extended periods of operation at higher emissions performance, to the extent that for peaking plant duties the unit could run for limited times at achievable emissions performance before needing to shut down.

5.1.9 The engine options are similar in cost.

5.2 Air Quality Effects

5.2.1 Statera's preferred option is to install either medium engines or large engines. The emissions performance of the smaller engine option is not as good and therefore excluded from any cost benefit assessment.

5.2.2 Based on annual NOx emissions Option 4 employing an OCGT could reduce emissions by approximately 130-150 tonnes per annum and Option 5 using a CCGT could reduce emissions by 190-210 tonnes per annum compared to Options 2 and 3. The additional equivalent annual for these options circa £3.4 million (equating to £23,000-£25,000 per tonne of NOx reduced) for the OCGT option and circa £12.8 million (£87,000-£99,000 per tonne of NOx reduced) for the CCGT option. It should be noted that for some aero-derivative designs where only 50% output is achieved in fast start mode double the capacity of plant would need to be installed to achieve the same output with associated increase costs.

5.2.3 These represent significant cost penalties for marginal reductions in annual mass of pollutant. For OCGT and CCGT, if start-up emissions are considered within total annual emissions then for peaking duties then cost penalties would increases further as a result of reduced NOx benefits of the OCGT and CCGT options.

5.2.4 Prior to finalising the design the selected plant would be subject to detailed dispersion modelling including a stack height assessment and the outcome of this modelling would need to demonstrate that the effects from the chosen design and stack height will not give rise to significant effects to the environment or human health.

5.3 Energy Efficiency (and related GWP)

5.3.1 It is clear that the CCGT option offers the potential to achieve higher efficiencies once at full load, but with part load efficiencies closer to that for the engine options. All engine options

have broadly similar performance, the OCGT is least efficient and like the CCGT option the stated efficiency falls at part load.

5.3.2 Considering the maximum efficiency for the engine options at 49.9%, a CCGT offers up to a 15.6 percentage point improvement but at an additional equivalent annual cost of over £12,000,000 compared to the engine options.

5.3.3 In a peaking market, operation at full load can be limited to only minutes and with higher start-up times both the CCGT and OCGT would operate for longer periods below design efficiency and with the potential benefits of higher efficiencies being short lived.

5.3.4 As identified outlined in paragraph 4.3.5 we have identified that the relative GWP performance of each option would broadly track efficiency performance. Whilst this addresses GWP to some extent, as GWP is not specifically a localised impact the GWP in the context of the energy generating market is considered relevant.

5.3.5 In dialogue between Statera Energy and EnAppSys [1] (providers of GB power market data) it was stated

'On 06/10/2016 Large stations were dispatched to cover 174MWh shortfall. Net CO_2 increase: 158 tonnes, gas reciprocating engines could have met the gap with net CO_2 increase of 84 tonnes (additional 74 tonnes of CO_2 was emitted) and at lower cost. (Diesel Recips Net CO_2: 104 tonnes, 54 tonne saving)

Carbon neutral forms of generation run baseload and hence their carbon savings are realised by the network continuously. It would not make sense to meet peak demand using biogas as this would result in lost opportunity for carbon savings with large fossil fired power stations filling the peak gap in efficiently. Analysis has shown almost a 50% reduction in carbon emissions when flexible generation is used as opposed to large fossil fired power

Peaking power stations only generate to meet immediate need and this is a cost and carbon effective way to cope with periods of high demand. Biogas can now be exported into the GB gas distribution network and studies are undergoing to further decarbonise the gas network meaning that these distributed assets located at the point of demand will take advantage of bio gas that injected into the grid remote from demand. This is an efficient way to use biogas going forward and the asset will benefit from this initiative.'

5.3.6 This supports the use of gas reciprocating engines within the existing energy supply mix as it provides associated GWP savings in reducing CO_2 emissions. Whilst conventional CCGTs provide efficient power generation this is better suited to baseload and associated GWP impacts are reduced for the market as a whole when operated in this mode.

5.3.7 GWP effects associated with more modern 'fast start' CCGTs which are operating below maximum full load efficiency are expected to be similar to those of engines and consequently would be comparable in terms of GWP effects. For OCGTs or fast start CCGTs operating in OCGT mode lower efficiencies are achieved and even at full load OCGTs perform least well.

6 BAT Conclusions

6.1.1 An assessment of small, medium and large gas engines and two types of gas turbines (OCGT and CCGT) for a 299.99 MWe peaking plant has been carried out.

6.1.2 The assessment has considered the suitability of each option to serve in the peaking market, the environmental performance in terms of air quality effects, visible plumes and energy efficiency (with related GWP).

6.1.3 It is concluded that the best technology for serving the peaking market are the engine options with the smaller engines providing the maximum flexibility. Engines have short start-up times providing wider opportunities to be called into operation in the event of short term peak demand. Conventional CCGT's are currently not cost effective, need to be at scale and do not provide start-up times fast enough to meet peaking plant needs. CCGT options with significantly reduced start-up times have been considered but at best these technologies can only achieve 10 minute start-up times and for some turbine designs to achieve fast-start rates operation at only 50% of the design output is achieved meaning to deliver the same electrical output as the engines this type of CCGT would require a facility double the size.

6.1.4 CCGTs have the lowest air quality effects when operating at high loads and highest full load efficiencies but perform least well in terms of potential for visible plumes. It is recognised that turbine efficiencies drop rapidly below full load and approach that of engines below circa 65% load and for fast start designs efficiencies open cycle operation reduces efficiencies to 40-44%. In the peaking market it is recognised that frequent start-ups and short lived operational performances will significantly reduce the periods of operation at higher efficiencies. Similarly the longer start-up and shutdown times give rise to extended periods of operation at high emissions and in peaking plant operation which is characterise by frequent start-up and shutdown the potential emissions benefits from CCGT operation is reduced.

6.1.5 Engines efficiencies are less sensitive to load but also the installation of multiple units would lead to greater flexibility by simply reducing the number of operational plant rather than operating some or all units at lower loads.

6.1.6 Whilst there are clear potential benefits from CCGTs and OCGTs in air quality terms and also in full load efficiencies for CCGTs, it is questionable to the extent these would be achieved in practice.

6.1.7 A consideration of cost has been presented and costs approaching of £100,000 per tonne of NOx saved are incurred for the CCGT option compared to the engines, with associated annual NOx savings of up to 150 tonnes and 210 tonnes respectively achieved by the OCGT and CCGT options. These potential savings are noted as being established on favourable emissions for OCGT and CCGTs and assume the peaking plant operates for the full 1,500 hours per annum.

6.1.8 Overall it is concluded that reciprocating engines represent BAT for a 299.99 MWe peaking plat at the Tilbury site, with the preferred option being either the large (Option 3) or medium (Option 2) sized engines.

RPS

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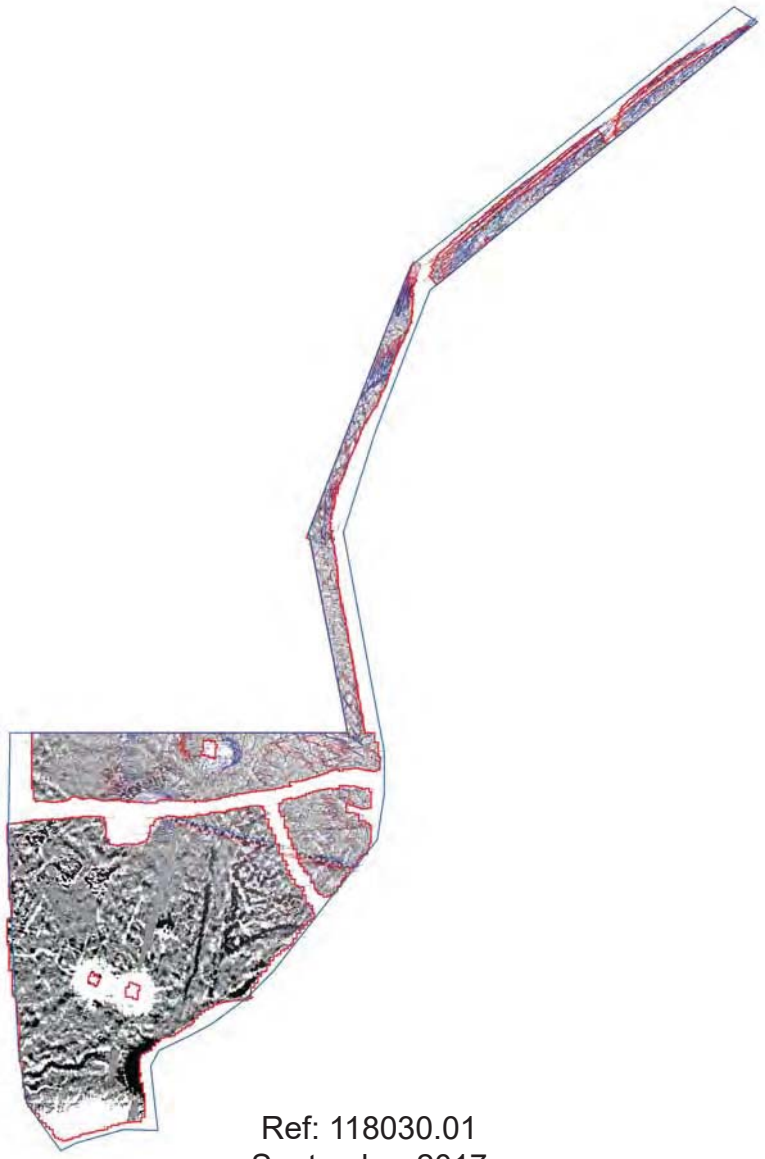
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Appendix B: Baseline Geophysical Survey

Land adjacent to Tilbury Substation Tilbury, Essex

Detailed Gradiometer Survey Report



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wessexarchaeology



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Summary

A detailed gradiometer survey was conducted over land adjacent to Tilbury Substation, Tilbury, Essex (centred on NGR 566194 176616). The project was commissioned by Statera Energy Ltd. with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features in support of a planning application for the development of the site as an extension of the power station infrastructure to the south.

The Site comprises arable fields located to the east of Tilbury with a designated survey area covering approximately 17.3 ha. The geophysical survey was undertaken between 21st August 2017 and 25th August 2017. The detailed gradiometer survey has demonstrated the presence of several strong rectilinear anomalies that could be archaeological in origin.

The anomalies identified as being of probable archaeological interest are linear and rectilinear in plan. These anomalies are interpreted tentatively as possible archaeology as due to the high prevalence of geological responses across the survey area, and it is not clear whether the anomalies themselves are geological in origin.

Additionally, this archaeological investigation has detected several modern services traversing the Site along with several areas of increased magnetic response and possible evidence of irrigation or drainage.

Acknowledgements

Wessex Archaeology would like to thank Statera Energy for commissioning the geophysical survey. The assistance of Kirsty Cassie is gratefully acknowledged in this regard.

Land adjacent to Tilbury Substation, Tilbury, Essex

Detailed Gradiometer Survey Report

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Statera Energy to carry out a geophysical survey at land north of Tilbury Substation, Tilbury, Essex (hereafter "the Site", centred on NGR 566194 176616) (**Figure 1**). The survey forms part of an ongoing programme of archaeological investigation being undertaken in support of a planning application for the development of the Site as an extension of the power station infrastructure to the south.

1.2 Scope of document

1.2.1 This report presents a brief description of the methodology, followed by the detailed survey results and the archaeological interpretation of the geophysical data.

1.3 The Site

1.3.1 The Site is located immediately north of Tilbury Substation and 2.15 km east of Tilbury in Essex (**Figure 1**).

1.3.2 The survey comprises a larger southern area of approximately 14 ha currently utilised for pasture and arable cultivation, and a linear northern area of approximately 3 ha across arable fields and along the edge of an access track. The Site is bounded by Tilbury Substation to the south, and arable land to the east, west and north. The railway between Tilbury and Linford forms the northwestern boundary to the site.

1.3.3 The Site is relatively flat, lying at approximately 1m OD across the survey area.

1.3.4 Several overhead cables traverse across and around the periphery of the Site. Two parallel sets cross the centre of survey area, and a third set traverses the south-eastern corner. The northern, linear portion of the survey area may be impacted by the continuation of the overhead cables to the south. Three pylons relating to the overhead cables are present on Site within the survey area, and several others around the periphery.

1.3.5 The solid bedrock geology comprises Seaford and Newhaven Chalk Formations. These are overlain by superficial deposits of alluvium (BGS online).

1.3.6 The soils underlying the Site are likely to consist of pelo-alluvial gley soils of the 813f (Wallasea 1) association (SSEW 1983). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.

2 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

2.1.1 A summary of the archaeological and historical background follows to outline the baseline for the survival of buried archaeological remains within the vicinity of the Site, using information available from the Essex Historic Environment Record (EHER) and the National Heritage List for England (NHLE). The following is a background summarising the findings.

2.2 Summary of the known archaeological resource

2.2.1 Within the Site, there are two historical assets noted within the EHER. The site itself is historically recorded as within the West Tilbury Marshes and the southern portion referred to as Walton Common.

2.2.2 There are no World Heritage Sites, Scheduled Monuments, Registered Parks and Gardens, Conservation Areas, Historic Battlefields, or Listed Buildings identified within the Site.

2.2.3 A Neolithic arrowhead (Monument Number 413484) was retrieved in 1973, a Roman lamp was uncovered in Thurrock in 1910 (Monument Number 413495), and a Roman burial was uncovered in West Tilbury with associated finds (Monument Number 413490).

2.2.4 Tilbury Fort is situated approximately 1.4km to the south-west of southern boundary of the survey area. While this is outside the wider study area of the historic and archaeological background, the Fort has been in use as a naval defensive structure since the 16th Century and much later in the 20th Century as an anti-aircraft placement during WWII. This may be relevant when considering the recorded data concerning anti-glider ditches noted within the survey area.

2.2.5 Th Site appears to have been predominantly occupied by arable farm and marsh land during the post-medieval period, and later in the mid-20th Century by anti-invasion structures. The archaeological potential for this period is considered moderate to high.

2.2.6 A large proportion of the wider area is covered by an area of known anti-glider ditches noted to be to the south-east of Bowater's Farm and north-east of Tilbury Power Station, forming part a network of aerial defence during WWII (MEX39674). Immediately north of the southern portion of the Site, a linear series of oyster beds is noted on historic aerial photographs from 1953 and 1955 (MEX39665).

2.2.7 Previous archaeological works undertaken in the wider study area include an archaeological watching brief by Oxford Archaeology (2006) that uncovered post-medieval remains of a farm building known to have occupied the site, comprising a wall and a fence. Further works were undertaken in Stanford Le Hope that uncovered no archaeological features or deposits.

2.2.8 No further evidence of any prehistoric, Romano-British, Saxon or medieval activity is recorded within the Site, although the absence of recorded evidence is likely to reflect the limited number of archaeological investigations undertaken in the vicinity.

3 METHODOLOGY

3.1 Introduction

3.1.1 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team between 21st August and 25th August 2017. Field conditions at the time of the survey were good throughout the period of fieldwork. An overall coverage of 14.2 ha was achieved, with any reduction the result of overgrown hedgerows bisecting the site along with other obstructions, which at the time of the survey included several pylons, pieces of farm machinery and the access track.

3.2 Aims and objectives

3.2.1 The aims of the survey comprise the following:

- to conduct a detailed survey covering as much of the specified area as possible, allowing for artificial obstructions;

- to clarify the presence/absence and extent of any buried archaeological remains within the site; and
- to determine the general nature of the remains present.

3.3 Fieldwork methodology

3.3.1 Individual survey grid nodes were established at 30m x 30m intervals using a Leica Viva RTK GNSS instrument, which is precise to approximately 0.02 m and therefore exceeds Historic England recommendations (2008).

3.3.2 The detailed gradiometer survey was conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1m between the fluxgate sensors and 1m horizontal separation between sensor housings. Data were collected at 0.25m intervals along transects spaced 1m apart with an effective sensitivity of 0.03nT, in accordance with Historic England guidelines (Historic England 2008). Data were collected in the zigzag method.

3.4 Data processing

3.4.1 Data from the survey were subject to minimal correction processes. These comprise a Zero Median Traverse function (±5nT thresholds) to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations in traverse position due to varying ground cover and topography. These two steps were applied throughout the survey area, with no further interpolation applied.

3.4.2 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

4.1 Introduction

4.1.1 The detailed gradiometer survey has identified magnetic anomalies across the Site, along with weaker anomalies of likely geological origin and a large amount of high magnitude, ferrous anomalies. Results are presented as a series of greyscale plots, XY plots and archaeological interpretations at a scale of 1:2,000 (**Figures 2, 3, 5** and **6**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image and ±25nT at 25nT per cm for the XY trace plots.

4.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt, or fired objects, and magnetic trends (**Figures 4** and **7**). Full definitions of the interpretation terms used in this report are provided in **Appendix 2**.

4.1.3 Numerous ferrous anomalies are visible throughout the dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.

4.1.4 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that more archaeological features may be present than have been identified through this survey.

4.1.5 Gradiometer survey may not detect all services present on Site. This report and accompanying illustrations should not be used as the sole source for service locations and appropriate equipment (e.g. CAT and Genny) should be used to confirm the location of buried services before any trenches are opened on Site.

4.2 Gradiometer survey results and interpretation

4.2.1 The geophysical survey has identified several features that are tentatively considered to be anthropogenic in origin and therefore, an interpretation of possible archaeology has been ascribed. These are predominantly located in the southern portion of the site, and comprise linear, curvilinear and rectilinear anomalies. Further anomalies likely to be geological or modern in origin have also been identified and interpreted as such in associated figures.

4.2.2 Towards the south-easternmost portion of the survey area (**Figure 7**), two parallel, moderate/high magnitude linear anomalies **4000** and **4001** have been identified aligned roughly north to south approximately 25m apart. **4000** is a more complete linear response, measuring approximately 180m long by 4.5m wide. **4001** is more fragmented and unclear against a much more variable magnetic background, measuring approximately 160m long by 5m wide. In addition, curvilinear anomaly **4002** can be seen branching to the north-east and curving round to the east from the approximate middle of **4001**. This anomaly is of a similar magnitude (+2 to +8 nT) and size to **4000** and **4001**. These anomalies have been interpreted as possibly archaeological in origin as due to their increased magnitude and alignment; they could be indicative of ditch-like features cut into the natural geology. It is considered possible that these anomalies may relate to WWII anti-glider ditches, although this interpretation is made less confident due to the strong magnetic background.

4.2.3 Several smaller and more discrete linear anomalies surround the anomalies at **4000**, **4001** and **4002**, appearing to intersect or form right angles with the parallel anomalies and therefore also tentatively considered to be archaeological in origin, as they may form part of the same network of ditch-like features, perhaps relating to anti-glider ditches.

4.2.4 Across the western portion of the southern area, several further linear and rectilinear anomalies **4003** to **4007** have been identified, with several smaller, discrete linear anomalies present. The responses are generally negative, measuring approximately 3m to 5m wide and of varying length. Their notable negative response against the background magnetic response and their form in plan suggest that these anomalies may be archaeological in origin. Their form and collinearity are consistent with enclosures or a network of ditches, perhaps relating to anti-invasion defences.

4.2.5 Towards the north-western extent of the southern area, several areas of increased magnetic response are noted (**4008**, **4009** and **4010**). Within these regions, several linear and rectilinear anomalies have been identified. The interpretation of these anomalies is uncertain, as it is not clear whether these responses are the result of modern dumps of debris or arise from more formalised features. The change in magnetic texture and apparent rectilinear form in plan suggest that they may be archaeological in origin, and it is possible that they relate to WWII emplacements.

4.2.6 Immediately north of the anomalies at **4008** – **4010**, a single linear anomaly on a north-west to south-east alignment has been identified (**4011**). This anomaly is typical of a ditch, with a weak positive response measuring approximately 35m long by approximately 2.5m wide against a locally low magnetic background. The anomaly is positioned to the north of an area of increased magnetic response and it may form part of a rectilinear feature with the anomalies at **4009**.

4.2.7 Several roughly linear anomalies **4012** can be seen near the southwesternmost extent of the survey area. These anomalies lie on a similar E-W alignment as the linear anomalies at **4004** and to the immediate west of **4009**. Due to their form and magnitude, the anomalies are considered to be of possible archaeological interest, perhaps also relating to the anti-glider ditches in the area. However, these anomalies are also consistent with infilled water management ditches of unknown date, as they appear to all connect with a water course to the west of the survey area.

4.2.8 Several linear and rectilinear anomalies have been identified in the northern portion of the larger southern area. **4013** is a negative linear anomaly of possible archaeological interest, although its location at the corner of the survey makes interpretation less definitive. Similarly, rectilinear anomaly **4014** is fragmented and lies at the edge of the survey area.

4.2.9 Several areas of increased magnetic response can be seen within the linear portion of the survey area (**Figure 4**), some of which are substantially stronger than others. Due to a lack of wider context and no clear form or consistency throughout the anomalies, they are interpreted as likely to be geological in origin and possibly relating to infilled former watercourses. Sinuous anomaly **4015** may be a canalised watercourse, although it is difficult to present a more definitive interpretation given the limited width of the survey area.

4.2.10 Several high magnitude, linear anomalies have been identified. Primarily, these are in the southern portion and the very north of the Site at **4016**, **4017**, and **4018** (**Figure 4**). The anomalies are typical of modern services, such as pipes. Similar responses **4019**, **4020** and **4021** can be seen across the northern portion of the larger area (**Figure 7**).

4.2.11 Several large high magnitude responses have been identified across the southern portion of the survey area. Several of these **4022**, **4023** and **4024** are associated with the pylons present in the field. Several linear bands of magnetic disturbance can be seen across the survey area, such as at **4025**, **4026**, **4027** and **4028**, due to interference from overhead cables. Anomalies at **4029** and **4030** along the southern boundary of the survey relate to the Tilbury Substation infrastructure immediately adjacent to the field boundary.

5 DISCUSSION

5.1.1 The detailed gradiometer survey has been successful in detecting a small number of anomalies perhaps more likely to be of archaeological interest, which are largely confined to the southern part of the survey area. These anomalies are linear, rectilinear and curvilinear in form, and could be indicative of anti-glider ditches as well as associated infrastructure dating from WWII.

5.1.2 Many anomalies have been identified as being of possible archaeological interest due to their form in plan, although the limited evidence from archaeological investigations and finds in the surrounding area makes their interpretation less conclusive; many of the responses could conceivably be of either natural or anthropogenic origins. Any future intrusive investigation, such as archaeological trial trenches, would provide direct information on the archaeological nature, or otherwise, of these anomalies and a dynamic review of the geophysical interpretation during this phase of investigation may provide a greater understanding of the surrounding anomalies of uncertain provenance.

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Old Maps (accessed September 2017) https://www.old-maps.co.uk

APPENDICES

Appendix 1: Survey Equipment and Data Processing

Survey methods and equipment

The magnetic data for this project was acquired using a Bartington 601-2 dual magnetic gradiometer system. This instrument has two sensor assemblies fixed horizontally 1m apart allowing two traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m separation, and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of 0.03nT over a ±100nT range, and measurements from each sensor are logged at intervals of 0.25m. All of the data are stored on an integrated data logger for subsequent post-processing and analysis.

Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. Both types depend upon the establishment of an accurate 20m or 30m site grid, which is achieved using a Leica Viva RTK GNSS instrument and then extended using tapes. The Leica Viva system receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by Historic England (English Heritage 2008) for geophysical surveys.

Scanning surveys consist of recording data at 0.25m intervals along transects spaced 10m apart, acquiring a minimum of 80 data points per transect. Due to the relatively coarse transect interval, scanning surveys should only be expected to detect extended regions of archaeological anomalies, when there is a greater likelihood of distinguishing such responses from the background magnetic field.

The detailed surveys consist of 20m x 20m or 30m x 30m grids, and data are collected at 0.25m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20m or 30m grid respectively, and are the recommended methodologies for archaeological surveys of this type (English Heritage 2008).

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125m intervals along traverses spaced up to 0.25m apart, resulting in a maximum of 28800 readings per 30m grid, exceeding that recommended by Historic England (English Heritage 2008) for characterisation surveys.

Post-processing

The magnetic data collected during the detail survey are downloaded from the Bartington system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

As the scanning data are not as closely distributed as with detailed survey, they are georeferenced using the GPS information and interpolated to highlight similar anomalies in adjacent transects. Directional trends may be removed before interpolation to produce more easily understood images.

Typical data and image processing steps may include:

- Destripe – Applying a zero mean traverse in order to remove differences caused by directional effects inherent in the magnetometer;

- Destagger – Shifting each traverse longitudinally by a number of readings. This corrects for operator errors and is used to enhance linear features;

- Despike – Filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data)

Typical displays of the data used during processing and analysis:

- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies.

- Greyscale – Presents the data in plan using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.

Appendix 2: Geophysical Interpretation

The interpretation methodology used by Wessex Archaeology separates the anomalies into four main categories: archaeological, modern, agricultural, and uncertain origin/geological.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Possible archaeology – used for features which give a response but which form no discernible pattern or trend.

The modern category is used for anomalies that are presumed to be relatively modern in date:

- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.
- Modern service – used for responses considered relating to cables and pipes; most are composed of ferrous/ceramic material although services made from non-magnetic material can sometimes be observed.

The agricultural category is used for the following:

- Former field boundaries – used for ditch sections that correspond to the position of boundaries marked on earlier mapping.
- Ridge and furrow – used for broad and diffuse linear anomalies that are considered to indicate areas of former ridge and furrow.
- Ploughing – used for well-defined narrow linear responses, usually aligned parallel to existing field boundaries.
- Drainage – used to define the course of ceramic field drains that are visible in the data as a series of repeating bipolar (black and white) responses.

The uncertain origin/geological category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Superficial geology – used for diffuse edged spreads considered to relate to shallow geological deposits. They can be distinguished as areas of positive, negative, or broad bipolar (positive and negative) anomalies.

Appendix 3: OASIS form

Project Details:

Project name		Land adjacent to Tilbury Substation, Tilbury, Essex			
Type of project		Detailed gradiometer survey (Field evaluation)			
Project description		A detailed gradiometer survey was conducted over land adjacent to Tilbury Substation, Tilbury, Essex (centred on NGR 566194 176616). The project had the aim of establishing the presence, or otherwise, and nature of detectable archaeological features in support of a planning application for the development of the site as an extension of the power station infrastructure to the south. The Site comprises arable fields covering approximately 17.3 ha located to the east of Tilbury. The geophysical survey was undertaken between 21st August 2017 and 25th August 2017, and has demonstrated the presence of several anomalies of possible archaeological origin. Several linear and rectilinear anomalies have been interpreted tentatively as possible archaeology due to the known presence of WWII anti-invasion defences and other emplacements nearby. Other anomalies are more clearly geological in origin. Several modern services can be seen, along with several areas of increased magnetic response and possible evidence of drainage.			
Project dates		**Start:** 21-08-2017		**End:** 25-08-2017	
Previous work		Not Known			
Future work		Not Known			
Project Code:	118030	**HER event no.**	N/A	**OASIS form ID:**	wessexar1-296552
		NMR no.	N/A		
		SM no.	N/A		
Planning Application Ref.					
Site Status					
Land use		Pasture/Hay/Silage			
Monument type			**Period**		

Project Location:

Site Address	Tilbury Power Station, East Tilbury, Essex			**Postcode**	RM18 8UJ
County	Essex	**District**	Tilbury / Thurrock	**Parish**	Tilbury
Study Area	17.3 ha	**Height OD**	1 m aOD	**NGR**	566194 176616

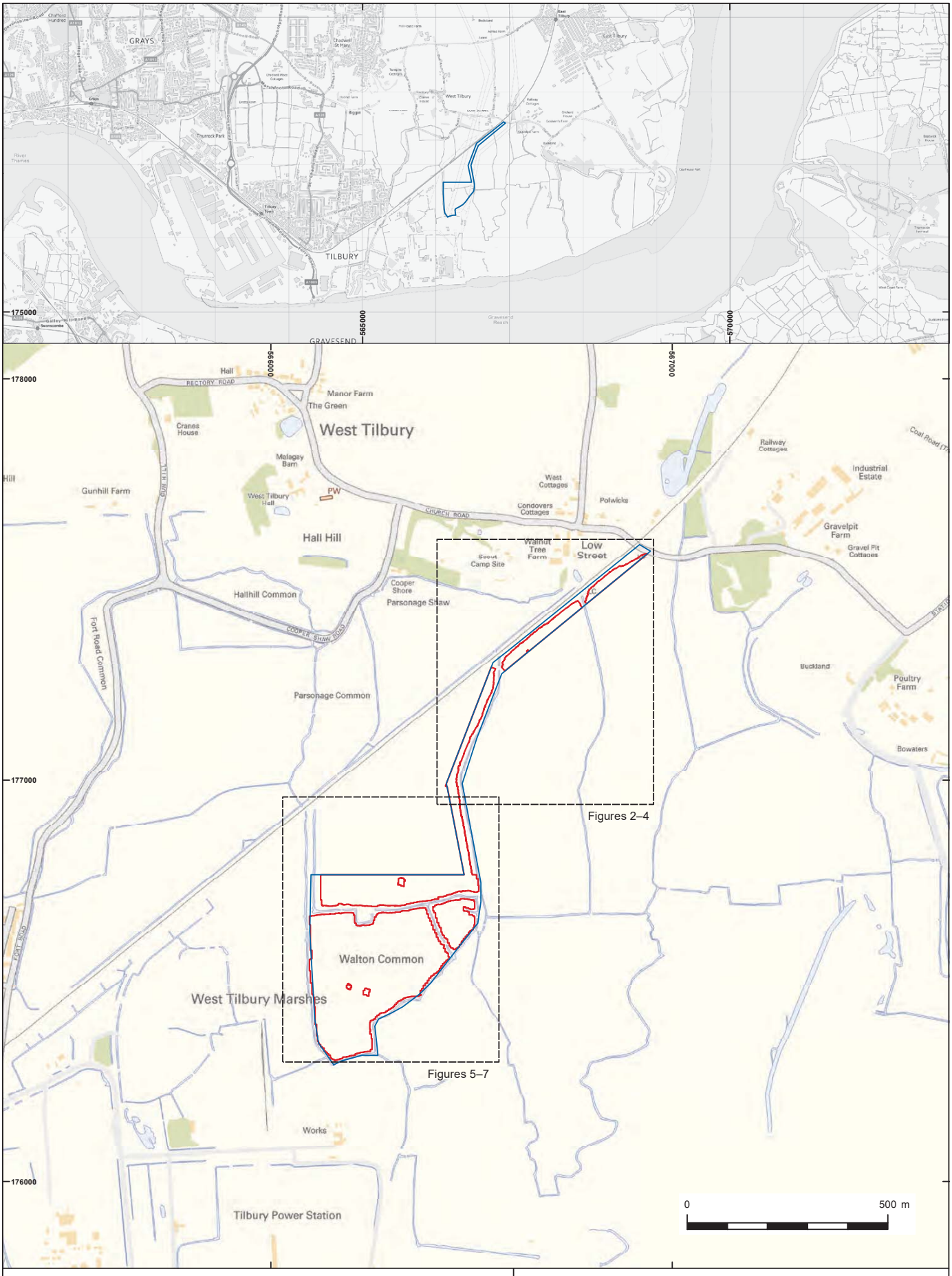
Project Creators:

Name of Organisation	Wessex Archaeology		
Project brief originator	Statera Energy Ltd.	**Project design originator**	

Project Manager	Ben Urmston	**Project Supervisor**	PV
Sponsor or funding body		**Type of Sponsor**	

Project Archive and Bibliography:

Physical archive	N/A	**Digital Archive**	Geophysics, survey and report	**Paper Archive**	N/A
Report title	Land Adjacent to Tilbury Substation, Tilbury, Essex			**Date**	2017
Author	Wessex Archaeology	**Description**	Unpublished report	**Report ref.**	118030.01



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Site boundary

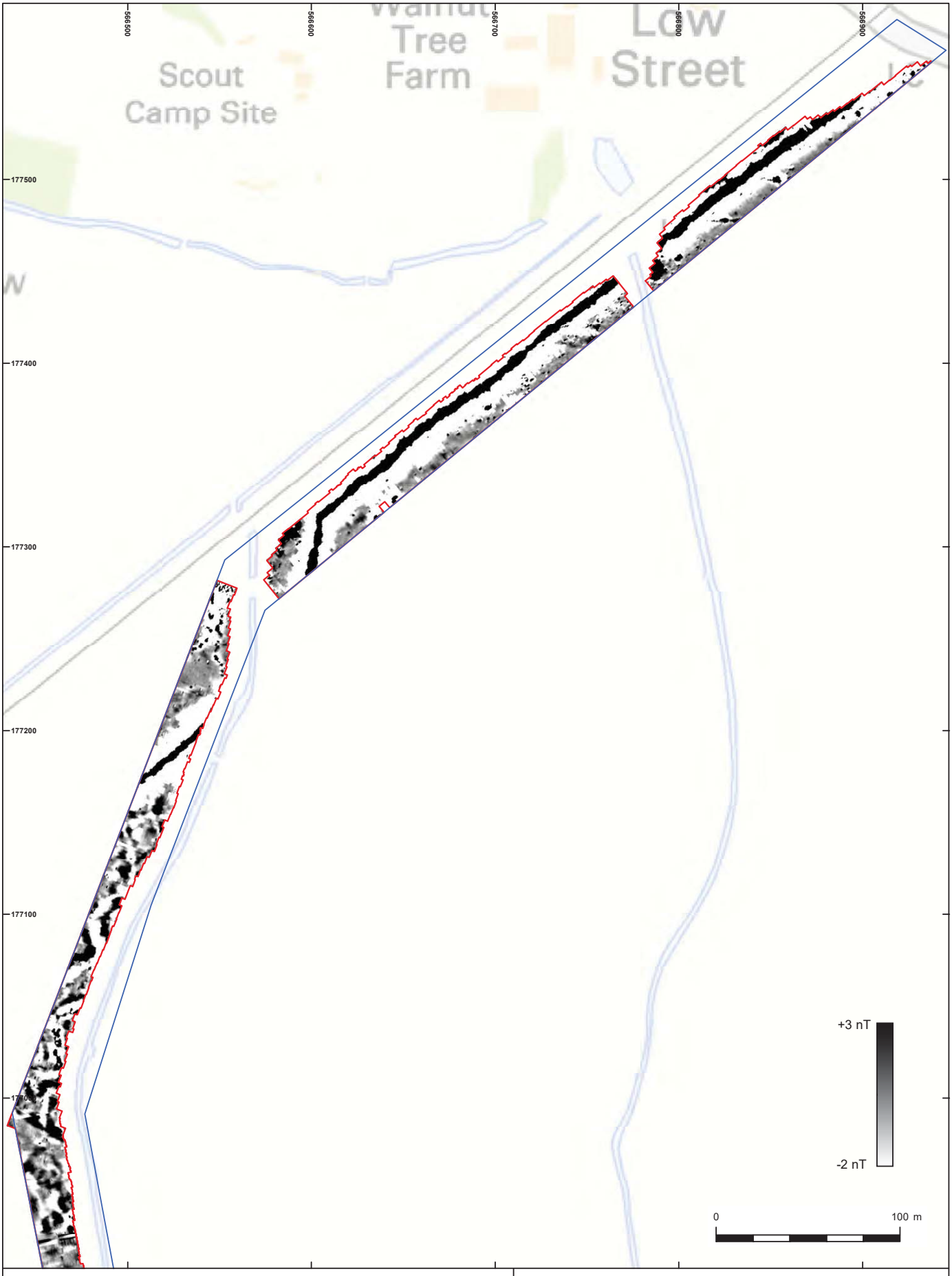
Detailed survey extents

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Site location

Figure 1



Coordinate system:
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Site boundary

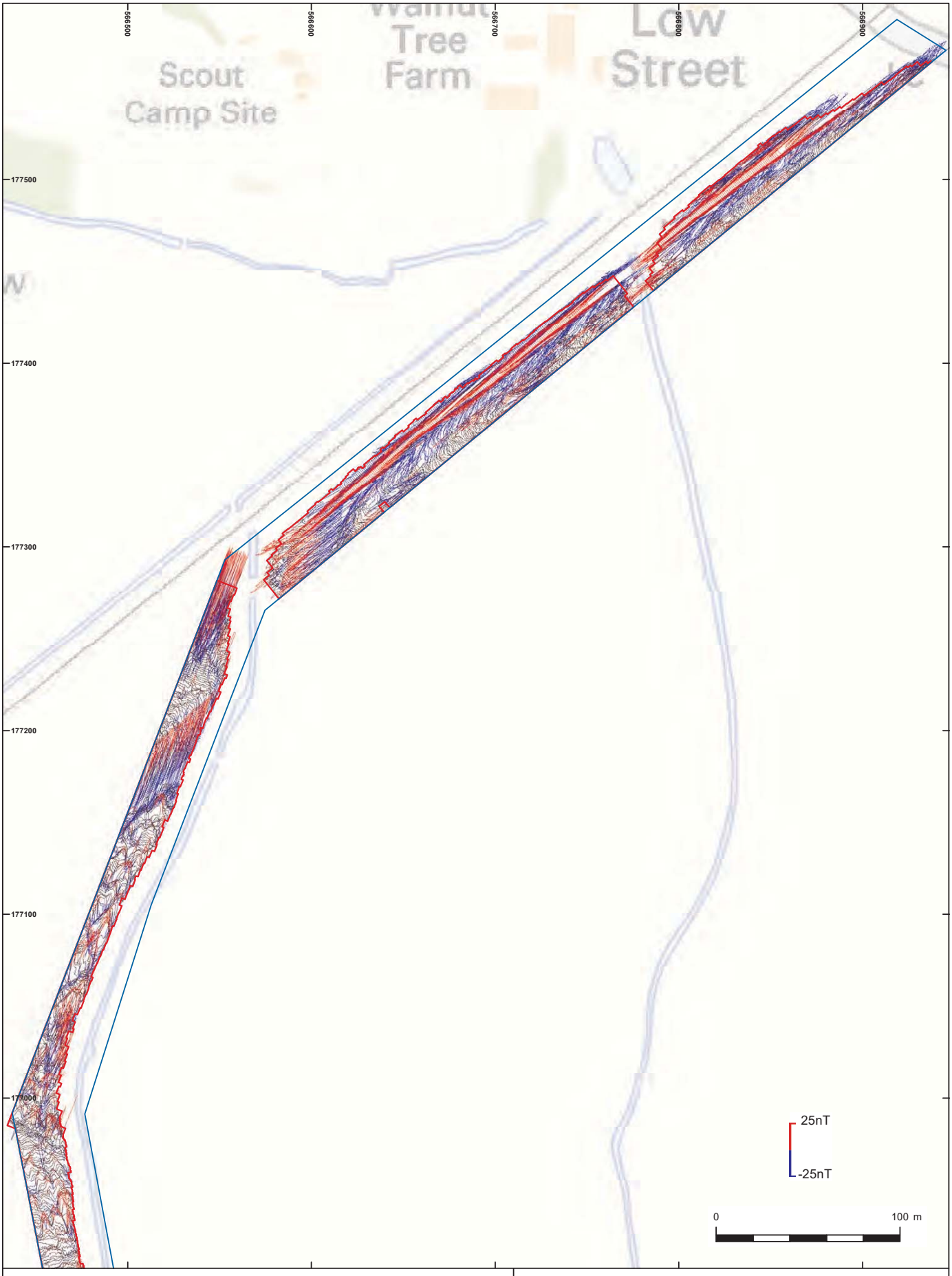
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Greyscale plot of north end of site

Figure 2



Coordinate system:
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Site boundary

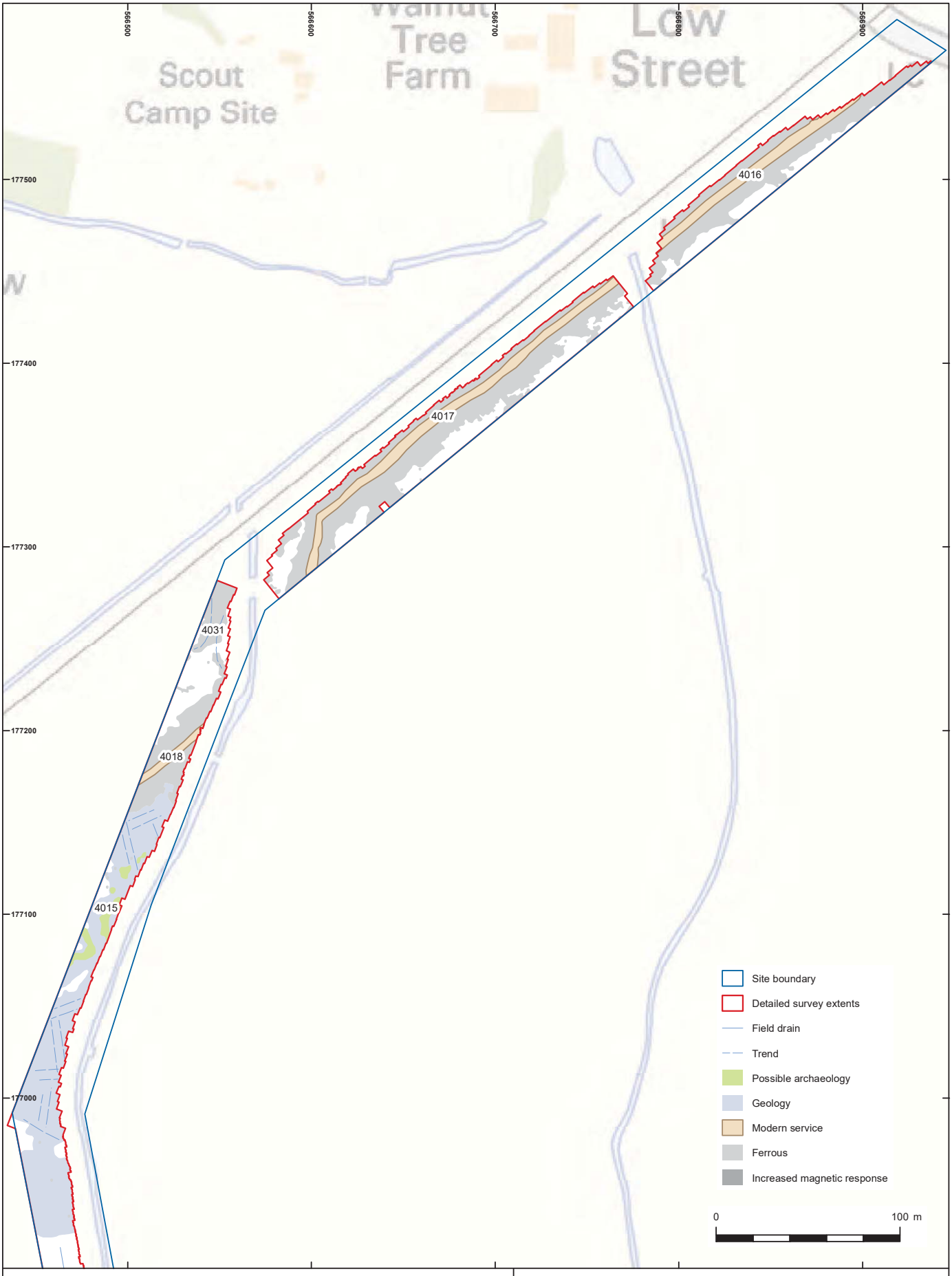
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XY Trace plot of north end of site

Figure 3



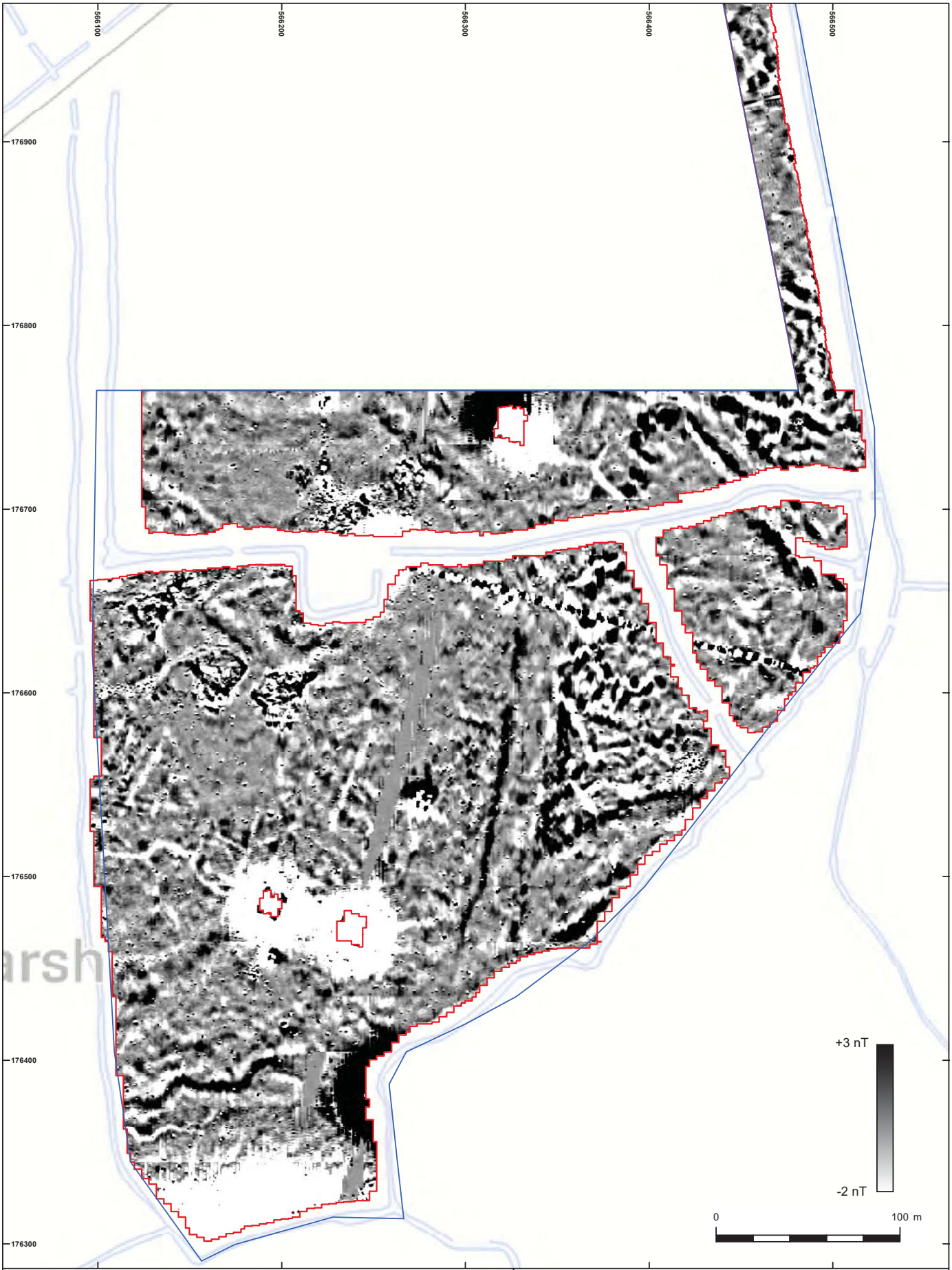
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Archaeological interpretation of north end of site

Figure 4



Coordinate system:
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Site boundary

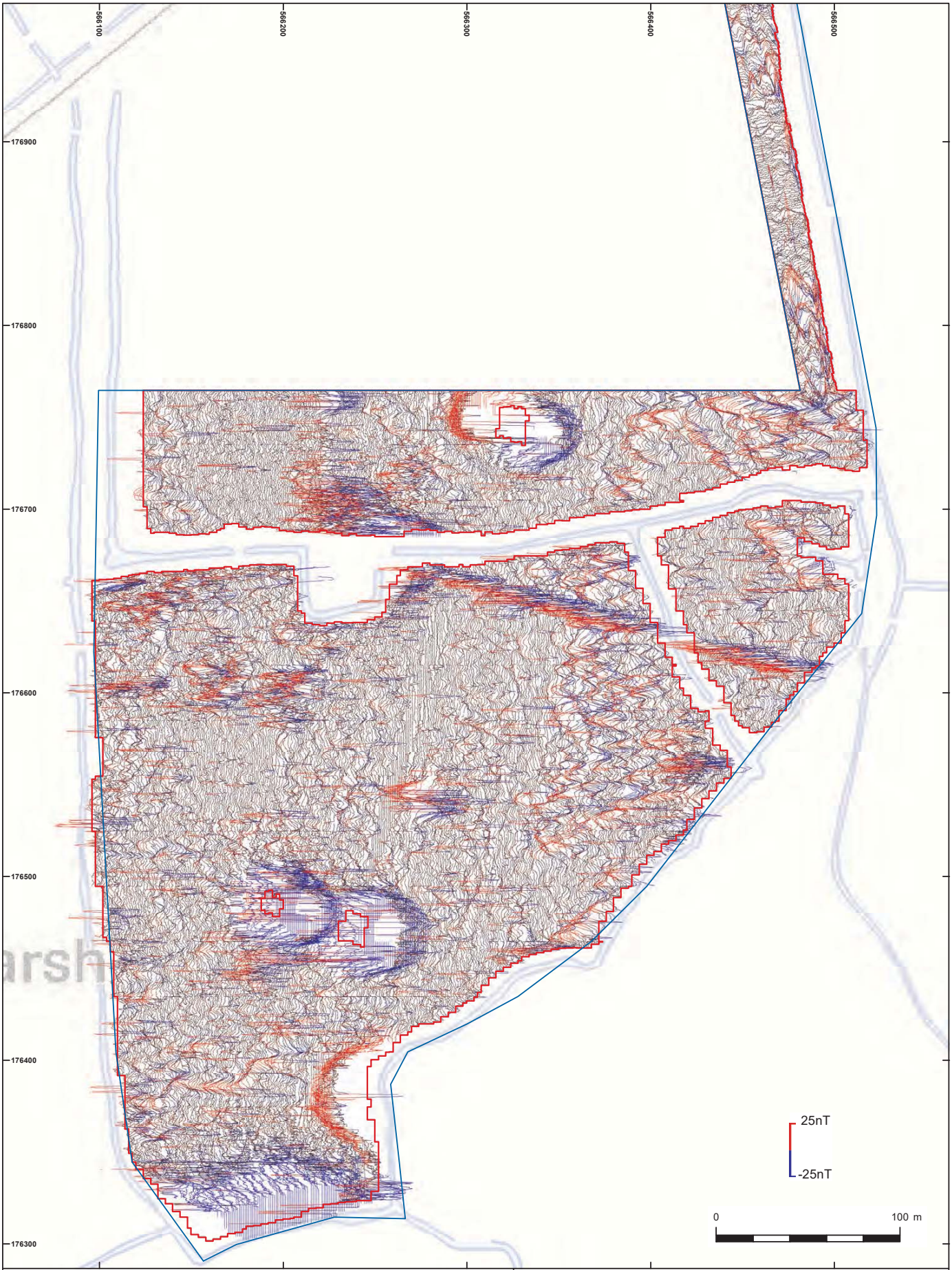
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Greyscale plot of south end of site

Figure 5



Coordinate system:
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Site boundary

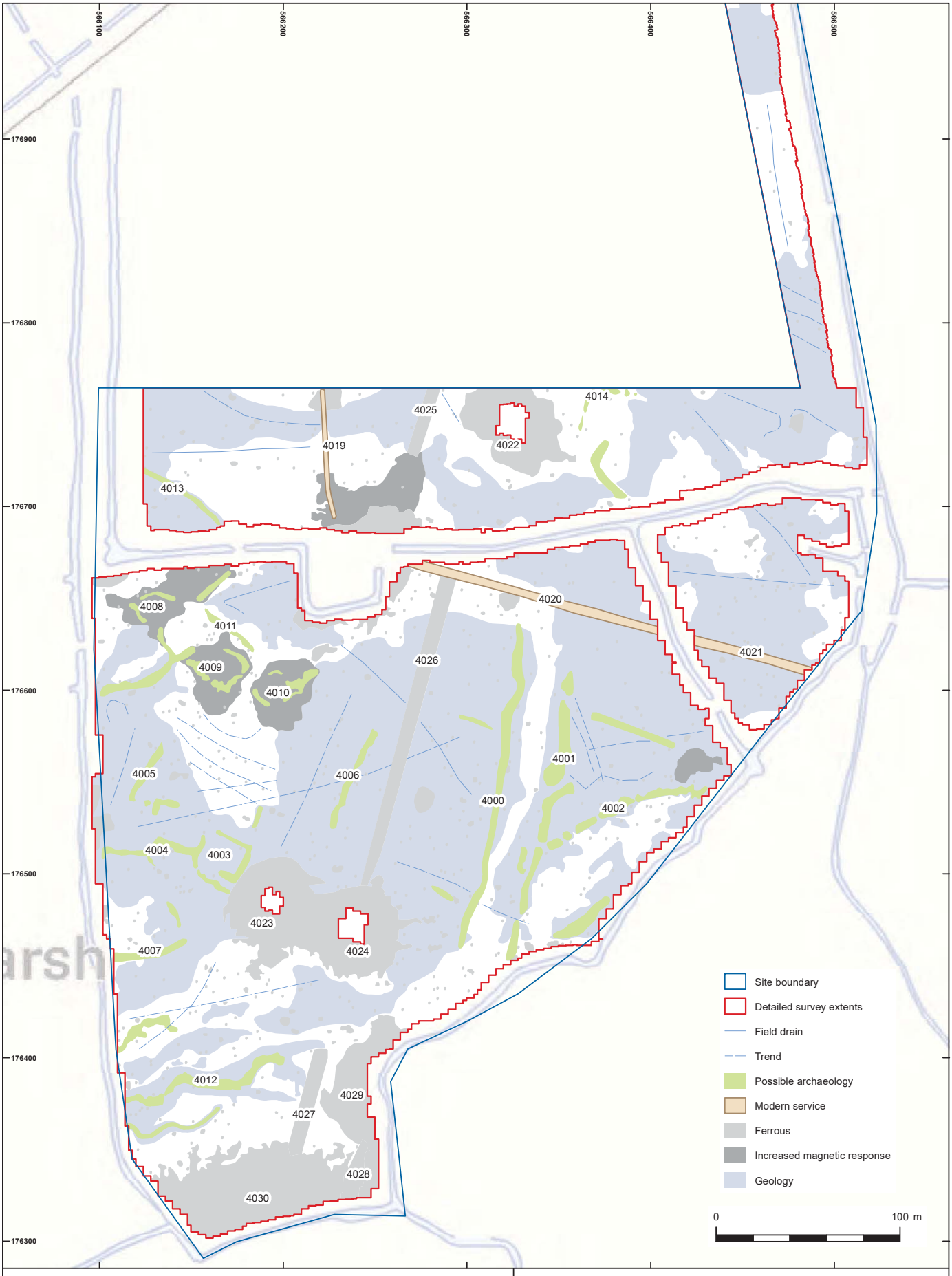
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XY Trace plot of south end of site

Figure 6



Coordinate system:
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XY Trace plot of south end of site

Figure 6



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Appendix C: 2017 Ecology Surveys

www.cherryfieldecology.co.uk

Report prepared for: Statera Energy (Kirsty Cassie)

For the Site of: Tilbury Substation, Walton Common, RM18 8UL

Date: 14/02/2017

Version: Draft, awaiting data (14/02/2017), Final awaiting data (14/02/2017), Updated including data (15/02/2017), Checked (17/02/2017)

Cherryfield Ecology has prepared this report for the named clients use only.

Ecological reports are limited in shelf life, Natural England usually expect reports for licenses to be no more than 12 months old and therefore should the project not proceed within 12 months of this report an updated survey should be undertaken in order to check for changes that may have occurred on site.

Martin O'Connor Dip, BSc (Hons), CBiol, MRSB

Bat license level 3 and 4. GCN level 1, Dormouse level 1 and Barn Owl

martin@cherryfieldecology.co.uk

07950279790

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Preliminary Ecological Appraisal (PEA)

0.0 None Technical Summary

0.1 Background -

The survey follows national guidelines JNCC (2010) allowing for a day-time inspection and recommendations for further surveys if considered necessary. If a deviation from the guidelines has been made this will be detailed in the Method Section.
The following report details the findings and recommendations for the site of Tilbury Substation, Walton Common, RM18 8UL.
The client commissioned Cherryfield Ecology to undertake a PEA as the proposals include for a gas turbine electricity station and a battery storage centre.

0.2 Results and Findings -

A very large site consisting of an arable and improved grassland field, with a long ditch system and scattered scrub, trees and tall ruderal vegetation. The site is suitable for common reptiles, GCN and badgers have been confirmed to be using the site for foraging.

0.3 Impact Assessment and Recommendations -

A loss of habitat for badgers will occur, as will a loss of habitat for GCN and reptiles should these be found to be present.
Full recommendations can be found in section 4 of the report, however further survey is recommended for reptile and GCN.

1.0 Introduction

The client, Statera Energy, has commissioned Cherryfield Ecology to undertake a PEA for the site of Tilbury Substation, Walton Common, RM18 8UL. Planning permission is being sought to build a new gas turbine and battery storage centre.

This survey has checked all habitats, buildings, trees or structures due to be affected by the proposals on site, this includes checks for protected species, signs of protected species or habitat value e.g. crevices, badger setts, ponds etc.

The inspection was conducted on the 14/02/2017.

The survey can only ever provide a 'snap shot' of the site at the time of the survey and circumstances may change following this report. Health and Safety restrictions or obstructions may limit the surveyor's ability to find evidence.

Biological records have been requested to give the report context and allow a study of the surrounds. The information is often sensitive and therefore a synopsis is provided and the full data released separately for verification.

The survey can be conducted year round with the optimal between mid-March and mid-October (south)/1st April and 30th September (north), however it can be limited due to bad weather and in the winter, when some species are not as active, thus evidence and species are often not found. During these periods habitat value (likely presence) becomes more important to the assessment of the site.

Summary of legislation and National Planning Policy that protects wildlife in England:

- Conservation of Habitats and Species Regulations 2010.
- Wildlife and Countryside Act 1981 as amended.
- Countrywide and Rights of Way Act 2000.
- Natural Environment and Rural Communities Act 2006.
- National Planning Policy Framework ("NPPF").
- Circular 06/05.

This legislation makes it illegal to:

- Intentionally or deliberately kill, injure or capture a protected species.
- Deliberately disturb a protected species, whether at rest or not.
- Damage, destroy or obstruct access to a resting place.

- Possess or transport a protected species or any part of that species, unless acquired legally.
- Sell, barter or exchange a protected species, or any part of a species.

1.1 Species Specific information: -

All EU protected species have the same protection and the detail under Bats also applies to GCN, Dormouse, Otters and the two EU protected reptiles.

1.1.1 Breeding birds

All nesting birds are protected under the Wildlife and Countryside Act (as amended) 1981, which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. Furthermore a number of birds enjoy further protection under that Act and are listed on Schedule 1 of the Act. These further protected birds are also protected from disturbance and it may be necessary to operate a "no-go" buffer zone around such nests – typically out to 5m.

1.1.2 Bats

All 18 species of bat common in the UK (17 known to be breeding) are fully protected under the Wildlife and Countryside Act (as amended) 1981 through inclusion in Schedule V of the Act. All bat species in the UK are also included in Schedule II of the Habitats Regulations 2010 which transpose Annex II of the Council Directive 92/43/EEC 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora ("EC Habitats Directive") which defines European protected species of animals.

Bats species are afforded further protection by the Countryside and Rights of Way Act 2000; and the Natural Environment and Rural Communities Act 2006.

This combined legislation makes it an offence to:

1. Intentionally or deliberately kill, injure or capture bats.
2. Deliberately disturb bats, whether at roost or not.
3. Damage, destroy or obstruct access to bat roosts.

4. Possess or transport bats, unless acquired legally.
5. Sell, barter or exchange bats.

1.1.3 Reptiles

There are six species of reptiles in Great Britain (Edgar et al. 2010) and four of these are commonly found; the grass snake (*Natrix natrix*), adder (*Vipera berus*), common lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*).

All native British species of reptiles are legally protected through their inclusion in Schedule V of the Wildlife and Countryside Act 1981. As such, all species are protected from deliberate killing or injury. Therefore, where development is permitted, and there will be a significant change in land use, a reasonable effort must be undertaken to avoid committing an offence. The same act makes the trading of native reptile species a criminal offence without appropriate licensing.

Two species of reptile; the smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*), are further protected through their inclusion in Schedule II of the Habitats Regulations 2010 which transposes Annex II of the Council Directive 92/43/EEC 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora ("EC Habitats Directive"), which defines European protected species of animals ("rare reptiles.")

1.1.4 Badgers

Badgers (*Meles meles*) Both the badger and its habitat are protected under The Protection of Badgers Act 1992, Schedule V of the Wildlife and Countryside Act 1981, and Appendix III of the Bern Convention 1979.

This legislation makes it an offence to:

- Kill, injure, take or possess a badger.
- Interfere with, damage or destroy a badger sett including e.g. obstruct access to a badger sett.
- Cruelly treat or harm a badger.
- Disturb a badger in a sett.

1.1.5 Great Crested Newts

Great crested newts (GCN) are listed in both Annex IV of the EC Habitats Directive and in Schedule V of the Wildlife and Countryside Act 1981.

GCN are afforded further protection by the Countryside and Rights of Way Act 2000; and the Natural Environment and Rural Communities Act 2006.

2.0 Methods

The survey follows the national guidelines JNCC (2010) and the following equipment is available for the inspection:

- Torches (e.g. LED Lensar type).
- Ladders (Standard 4m telescopic surveying ladder).
- Endoscope where holes, cracks and crevices are accessible.
- Mirrors (extendable and movable mirror face).
- Binoculars (Pentax close focus).
- Thermometer/hygrometer.
- Camera.
- Sample bags for collecting dropping and feeding evidence.

Target notes are made when appropriate to highlight e.g. protected species or an 'other feature(s)' of ecological note.
If a deviation from the guidelines has been made the reason and justification will be explained below: -
The survey has been conducted outside the optimal period, however due to the nature of the site it is considered that no important habitats or features has been missed.

2.2 Limitations

This survey provides a snap –shot of the site at the time of the survey(s) only. Species are highly mobile and can and do turn-up from time to time unexpectedly. All care has been taken to ensure the results and recommendations are suitable to the context of the development and the information gathered on surveys.

Table 1: Habitat value (likelihood) of protected species presence assessed against Collis (2016), Edgar *et al* (2010) and NE (2007) etc.

Likelihood of species presence (Habitat Value)	**Features that species can and will use, regardless of evidence being present.**
Confirmed Presence	Species are found to be present during the survey. Evidence of species is found to be present during the survey.
Higher likelihood of presence.	Buildings, trees or other structures with features of particular significance for use by protected species e.g. nesting habitat, roosting opportunities, and ponds. Habitat of high quality for foraging e.g. broadleaved woodland, tree-lined watercourses and grazed parkland. Site is connected with the wider landscape by strong linear features that would be used by commuting species e.g. river and or stream valleys and hedgerows. Site is close to known locations of records for protected species.
Moderate and Lower likelihood of species presence.	Several potential habitat opportunities in buildings, trees or other habitats. Habitat could be used for foraging e.g. trees, shrub, grassland or water. Site is connected with the wider landscape by linear features that could be used by commuting species e.g. lines of trees and scrub or linked back gardens. A small number of less significant habitat opportunities. Isolated habitat for foraging e.g. a lone tree or patch of scrub. An isolated site not connected by prominent linear landscape features.
Negligible likelihood of species presence.	No features suitable for roosting, minor foraging or commuting.

3.0 Results

The following section details the results of the desk study, inspection and survey, it includes MAGIC information, biological records data and map/aerial photo information. The results detail the building, structure or tree (numbered for reference) description of any evidence found and habitat value if no evidence has been located.

3.1 Desk Study

The desk study is centred on Grid Ref – TQ663770 and postcode – RM18 8UL (nearest to site).

Table 2: Weather records –

Temperature	11C
Cloud cover	0
Precipitation	none
Wind	1/8

3.2 Magic:

The following statutory sites have been located on the search (2km) see Figure 1 –

- There are no SSSI's or EPS licenses issued within the search area. However there is a great crested newt license found just outside of the 2km radius to the north and Mucking Flats and Marshes SSSI is found to the east.

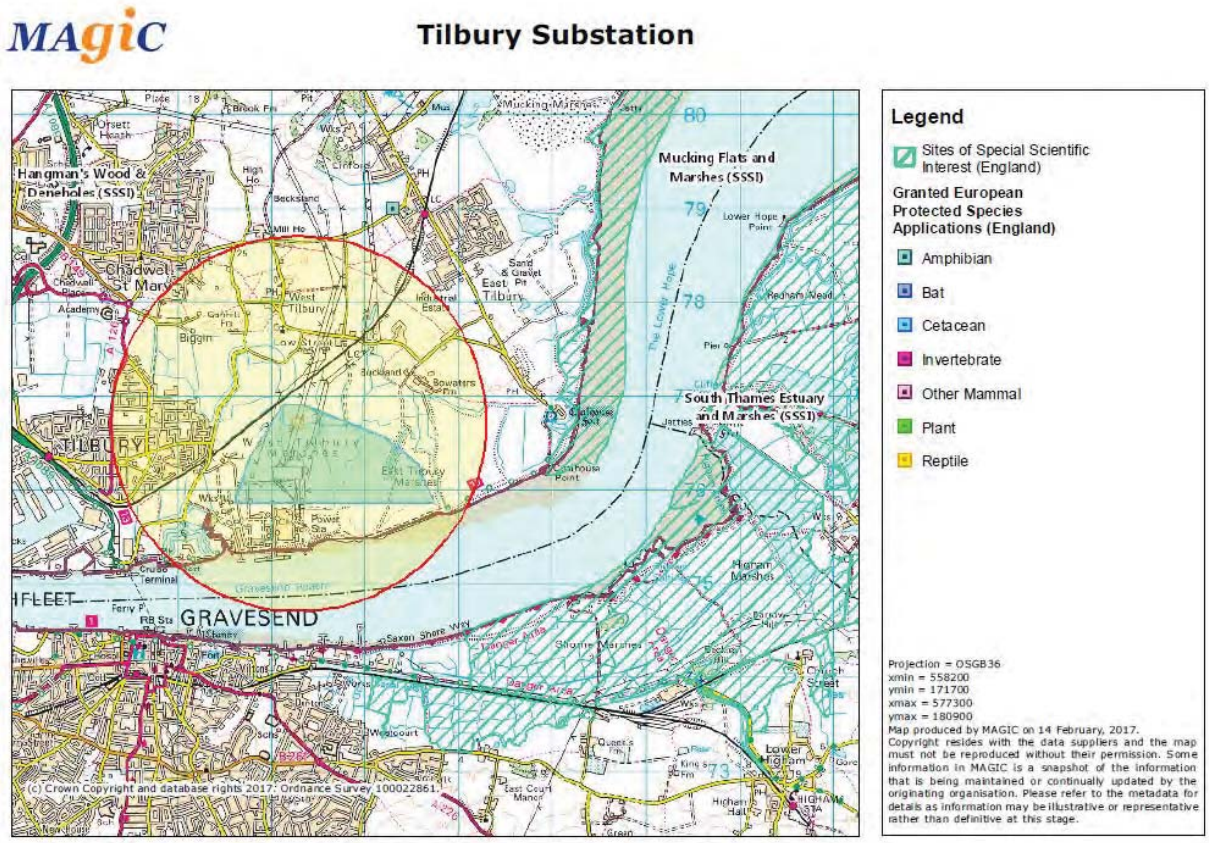


Figure 1: Magic search

3.3 Biological Records Data:

A standard 1km or 2km data search of existing records for protected species and nature reserves has been commissioned, below details the results and site context:

Biological records have been ordered from Essex Records Centre (ERC, 2017). There are two local wildlife sites close to the site of development, with a further four well outside 1km of the site. The first of these is known as Lytag Brownfield Site and it sits approx. 200m to the west of the site. Survey works undertaken on the site has shown there to be a good population of common reptiles present, including slow –worm, common lizard, adder and grass snake. The second is known as The Tilbury Centre located approx. 500m southwest of the site. It is designated for a complex mosaic of grassland, flower-rich early successional/pioneer vegetation, ditches, a small reedbed and a pond, notable for its colony of Stonewort *Chara sp*. and the nationally rare (Red Data Book)

Great Silver Beetle *Hydrophilus piceus*. The pioneer vegetation includes abundant Bird's-foot Trefoil *Lotus corniculatus*, on which the national BAP bumblebees *Bombus humilis* forages. Other important invertebrates have also been recorded here.

Species information is lacking from the area, with only seven records, three of which are for badger. The others include bluebell and three butterfly records.

3.4 Site Location and Surrounds:

The site is located in Essex, Tilbury and is surrounded by arable fields in the immediate local. Table 3 details the commuting, feeding and habitat features in a 1km radius of the site.

Table 3: Habitat features suitable for bat use

Feature	Description
Water course	The river Thames is located approx. 600m to the south of the site. There are many agricultural drainage ditches within the surrounds.
Water bodies	A large pond is located to the west of the site, approx. 100m from the boundary.
Woodland	No true woodland is located within 2km of the site, however small area of scrubby woodland is found scattered across the landscape.
Linear e.g. hedgerows	Defunct agricultural hedges are found scattered across the landscape in all directions.
Pasture/arable/grassland	The dominant land-use in the area is arable with grazed fields to the north.
Other	A railway line runs east/west to the north of the site.

3.2 Habitat, Building, Tree or Other Structure

The following section details the structures/habitat reference, description, evidence located and likelihood of species presence (see Figure 11 for site plan).

3.3 Habitats

3.3.1 Hardstanding

A rough gravel and chipped tarmac track that runs along the northern boundary of the site (see Figure 2). It is beginning to grow over in places.



Figure 2: Example of the track

3.3.2 Arable

A very large arable field approx. 16.2Ha in size. It currently has a winter crop sown, most likely winter wheat (see Figures 3 and 4).



Figure 3: Example of the arable field



Figure 4: Example of the arable field

3.3.3 Improved Grassland

Another large field approx. 11.2Ha in size. It consists of rough improved grassland, with evidence that it has been grazed in the past. Dominant species include perennial ryegrass *Lolium perenne* and couch grass *Elymus repens* with occasional meadow foxtail *Alopecurus pratensis*. Herb species are few and far between with occasional creeping buttercup *Ranunculus repens* and plantains (see Figure 5 and 6).



Figure 5: Example of the improved grassland



Figure 6: Example of the improved grassland

3.3.4 Trees

There are a small number of trees found scattered along the ditches on site. These include oak *Quercus robur,* ash *Fraxinus excelsior* and poplar *Populus sp*.

3.3.5 Scrub

Scrub is also found along the edges of the ditches with hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa* dominating (see Figure 7).



Figure 7: Example of trees and scrub

3.3.6 Tall Ruderal

Vegetation found between the scrub and trees along the ditches includes species such as bramble *Rubus fruticosus agg.*, nettle *Urtica dioica* and common reed *Phragmites australis* that have infilled the gaps between the hedge lining the ditches.

3.3.7 Ditches

The entire site is encompassed by a ditch system. These are approx. 1m to 1.5m wide and some have been recently cleared out (see Figure 8 and 9). Where vegetation is found it is completely dominated by common reed. A Habitat Suitability Index (HSI) was conducted on a sample of the ditch as follows: -



Figure 8: Example of ditch system, cleared to the left.



Figure 9: Example of ditch with cleared side to the right

Table 4: HSI for the ditch system

Suitability Index	Factor	Notes	Score
SI 1	Location	Optimal	1.00
SI 2	Pond area	3181m2	0.80
SI 3	Pond drying	rarely	1.00
SI 4	Water quality	bad	0.01
SI 5	Shoreline shade	50%	1.00

SI 6	Fowl	minor	0.67
SI 7	Fish	absent	1.00
SI 8	No ponds/km^2*	1	0.65
SI 9	Terrestrial habitat	poor	0.33
SI 10	Macrophytes	50%	0.80
Multiplied together			9E-04
HSI			0.50
* Not separated by major barrier			

Therefore the ditch system is of a poor suitability for GCN, however the HSI is not conclusive.

3.3.8 Ponds

A large pond (3499m2) located approx. 100m to the west of the site. It is surrounded by common reed and rough grassland/scrub (see Figure 10). As with the ditch system a HSI was conducted as follows -



Figure 10: Example of the pond

Table 5: HSI for the off-site pond

Suitability Index	**Factor**	**Notes**	**Score**
SI 1	Location	Optimal	1.00
SI 2	Pond area	3499m2	0.80
SI 3	Pond drying	never	0.90

SI 4	Water quality	moderate	0.67
SI 5	Shoreline shade	20%	1.00
SI 6	Fowl	minor	0.67
SI 7	Fish	Present	0.33
SI 8	No ponds/km^2*	1	0.65
SI 9	Terrestrial habitat	moderate	0.67
SI 10	Macrophytes	20%	0.80
Multiplied together			4E-02
HSI			0.72
* Not separated by major barrier			

Therefore the pond is of good suitability for GCN, again this is not conclusive.

Table 6: Target notes

Target Note	Description
T1	Badger latrine
T2	Badger footprint

3.4 Species List

Annual Meadow-grass *Poa annua*
Ash *Fraxinus excelsior*
Bent *Agrostis* sp.
Black Medick *Medicago lupulina*
Blackthorn *Prunus spinosa*
Bramble *Rubus fruticosus agg.*
Bristly Oxtongue *Picris echioides*
Cat's-ear *Hypochaeris* sp.
Cleavers *Galium aparine*
Cock's-foot *Dactylis glomerata*
Comfrey *Symphytum* sp.
Common Bent *Agrostis capillaris*
Common Chickweed *Stellaria media*
Common Mallow *Malva sylvestris*
Cow Parsley *Anthriscus sylvestris*
Crane's-bill *Geranium* sp.
Creeping Buttercup *Ranunculus repens*
Creeping Cinquefoil *Potentilla reptans*

Creeping Thistle *Cirsium arvense*
Daisy *Bellis perennis*
Dandelion *Taraxacum officinale*
Dock *Rumex* sp.
False Oat-grass *Arrhenatherum elatius*
Field Bindweed *Convolvulus arvensis*
Garlic Mustard *Alliaria petiolata*
Germander Speedwell *Veronica chamaedrys*
Good-King-Henry *Chenopodium bonus-henricus*
Great Willowherb *Epilobium hirsutum*
Ground-ivy *Glechoma hederacea*
Groundsel *Senecio vulgaris*
Hard Rush *Juncus inflexus*
Hawkbit *Leontodon* (sp.)
Hawthorn *Crataegus monogyna*
Hedge Bindweed *Calystegia sepium*
Herb-Robert *Geranium robertianum*
Ivy *Hedera helix*
Ivy-leaved Speedwell *Veronica hederifolia*
Mugwort *Artemisia vulgaris*
Mullein *Verbascum sp.*
Nettle *Urtica dioica*
Nipplewort *Lapsana communis*
Oak *Quercus* sp.
Perennial Rye-grass *Lolium perenne*
Poplar *Populus* sp.
Red Clover *Trifolium pratense*
Red Dead-nettle *Lamium purpureum*
Red Fescue *Festuca rubra*
Redshank *Persicaria maculosa*
Ribwort Plantain *Plantago lanceolata*
Sheep's Sorrel *Rumex acetosella*
Teasel *Dipsacus fullonum*
Timothy *Phleum pratense*
White Clover *Trifolium repens*
White Dead-nettle *Lamium album*
Willow *Salix* sp.
Willowherb *Epilobium* sp.
Yarrow *Achillea millefolium*
Yorkshire-fog *Holcus Lanatus*

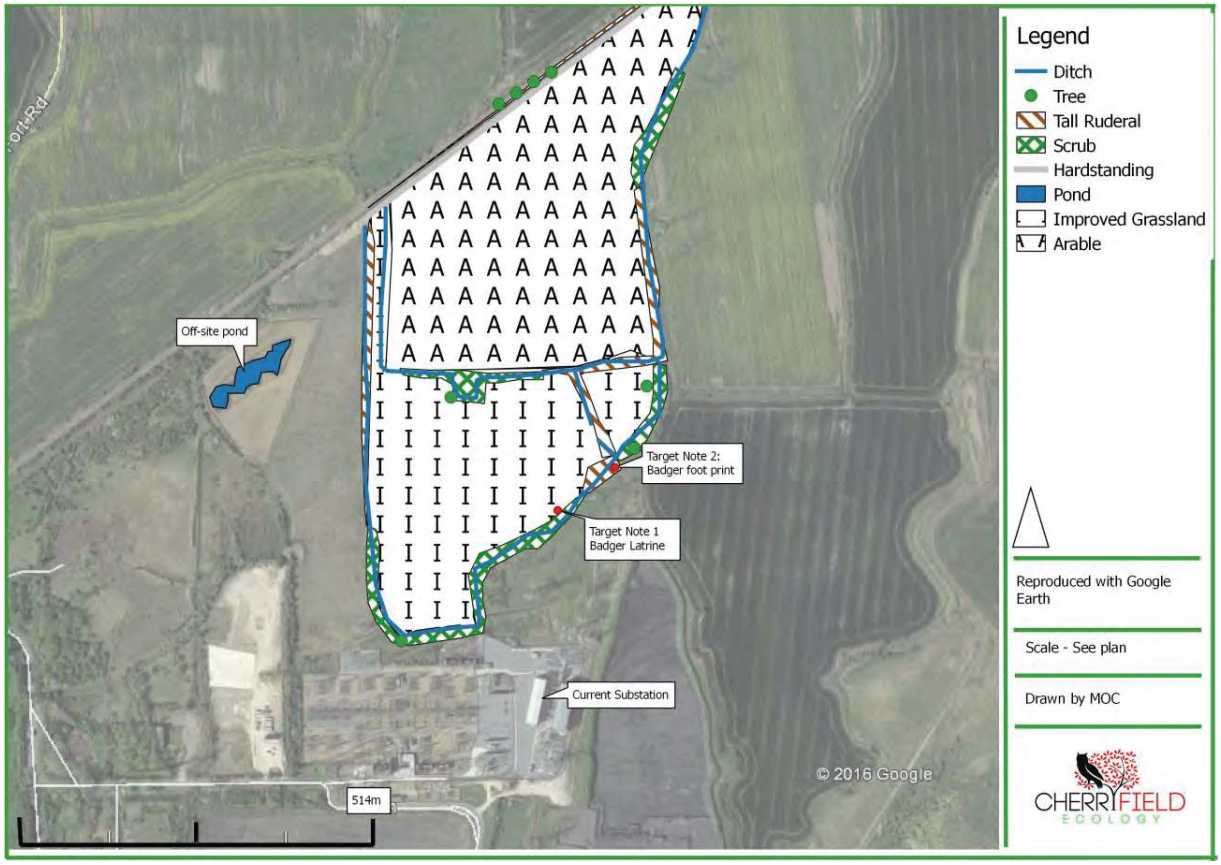


Figure 11: Site plan

3.5 Evidence or Likelihood of Species Presence

3.5.1 Bats

No evidence of bat use was found, it is likely that bats could use the general area for commuting and foraging.

3.5.2 Badgers

No badger setts found, however snuffle holes, a latrine and a footprint were found (see Figures 12 and 13). It is likely that a sett is located somewhere in the general area, however not within 30m of the site.



Figure 12: Latrine



Figure 13: Badger print, red circle indicates

3.5.3 Breeding Birds

No in-use or disused nests found, however the scrub and scattered trees offer nesting habitat, as well as the rough improved grassland for ground nesting birds.

3.5.6 Amphibian

The arable and improved grassland fields are considered unsuitable for amphibians. The ditch system with tall ruderal/scrub and trees with an off-site pond and its surrounds are considered suitable for amphibians. Therefore it is possible that amphibians could move around the fields and into more suitable foraging habitat.

3.5.7 Reptile

The site offers suitable habitat for common reptiles such as slow worm *Anguis fragilis* and common lizard *Zootoca vivipara*, with scrub, tall ruderal, water and bare/basking areas. The railway line directly to the northern boundary also offers these habitats linking directly to the site.

3.5.8 Other Mammal e.g. dormouse

The ditch system could be suitable for use by water vole *Arvicola amphibious* however no sign could be found, therefore it is consider unlikely that water vole are present. No other protected species were noted.

3.5.9 Invasive none/native

No schedule 9 species were found.

4.0 Conclusions, Discussion and Recommendations

The following section details the conclusions, discussion and recommendations in the context of the proposed works.

4.1 Conclusion, Discussion and Potential Impacts

The full development plans are not yet available, however it will involve building a large building to house a battery storage facility and gas turbine for providing electricity. By its very nature this will involve a large land take and associated infrastructure, which will include roads, security and staff areas.

There are two main ecological issues on site, these being reptiles and GCN with badgers and breeding birds being a minor consideration.

Reptiles are likely to be using the sites ditch system and improved grassland area. The pond off-site had the remains of reptile tins around it indicating these have been surveyed for in previous studies. The data supplied by Essex Records Centre indicates that all four common reptiles will be present. If found to be present there would be a loss of habitat within the general area.

GCN could be using the sites ditch system and the off-site pond. GCN records are found just north of a 2km magic search and although GCN generally remain within 350m of the breeding pond, lone males are known to travel up to 1.7+km in search of females. Therefore if present GCN could be lost in the development and terrestrial habitat would be lost.

Badgers are likely using the improved grassland and rough strips along the sites ditch system for foraging, although no sett was found within the site or within 30m of the boundary a loss of foraging habitat will occur.

Breeding birds are likely to use the site in the nesting season, including the rough improved grassland area.

4.2 Recommendations

Reptiles – A full reptile survey will be required to establish presence or likely absence. This involves placing out 'tins' (bitumen tiles or corrugated tin) in suitable areas of the site and then checking these over a seven week period. No further vegetation removal should occur until a likely absence has been established. If found to be present a mitigation plan will be required, which will include trapping reptiles out and moving them to suitable habitat.

GCN – In the first instance an eDNA survey should be undertaken to establish if GCN are present or absent from the ditch and off-site pond. If the eDNA is negative no further works are required, however if positive full GCN surveys will be required. These surveys are limited to Mid - April to Mid – May in to June.

Badger – no further work is considered necessary at this stage however a mitigation plan will be required in order to prevent accidental trapping when the works are undertaken.

Breeding bird – All vegetation removal should occur outside of March to September, however if not possible a check of all nesting habitat will be required. If a in-use nest is found a buffer no less than 3m will be enforced around the nest until it is no longer in use.

5.0 References

Collins, J. (ed), (2016), Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition, BCT, London

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Natural England (2007). Badgers and Development a Guide to Best Practice and Licensing. Natural England. Bristol.

Paul Edgar, Jim Foster and John Baker (2010). Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth

Records: Essex Records Centre, (2017) Records Data, ERC

Tom Langton, Catherine Beckett and Jim Foster (2001). Great Crested Newt Conservation Handbook. Froglife.

www.cherryfieldecology.co.uk

Report prepared for: Statera Energy (Kirsty Cassie)

For the Site of: Tilbury Substation, Walton Common, RM18 8UL

Date: 31/05/2017

Version: Draft (31/05/2017), Final (31/05/2017), Checked (03/06/2017).

Cherryfield Ecology has prepared this report for the named clients use only.

Ecological reports are limited in shelf life, Natural England usually expect reports for licenses to be no more than 12 months old and therefore should the project not proceed within 12 months of this report an updated survey should be undertaken in order to check for changes that may have occurred on site.

Martin O'Connor Dip, BSc (Hons), CBiol, MRSB

Bat, GCN, Dormouse and Barn owl licenced

[redacted]

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Full Common Reptile Survey

0.0 None Technical Summary

Background -

The survey follows national guidelines allowing for refuges, commonly known as 'felts', to be placed across the site and then checked for reptiles. Recommendations for mitigation if considered necessary are detailed in section 4. If a deviation from the guidelines has been made this will be detailed in the Method Section.

The following report details the findings and recommendations for the site of Tilbury Substation, Walton Common, RM18 8UL.

The client commissioned Cherryfield Ecology to undertake a full reptile survey as the proposals include for a gas turbine electricity station and a battery storage centre.

Results and Findings -

All four common reptile species have been found on site, including grass snake, adder, common lizard and slow worm. Slow worm and common lizard have good populations, with both snake species having very low populations (one of each being found).

Impact Assessment and Recommendations -

All four common species will be impacted by the development, with habitat being lost in the development.

Reptile trapping will be required prior to the development taking place. This will include fencing the construction zone and the access route into the site, with a suitable reptile fence and trapping out the reptiles, please refer to section 4 for full detail.

1.0 Introduction

The client, Statera Energy, has commissioned Cherryfield Ecology to undertake a full reptile survey (FRS) for the site of Tilbury Substation, Walton Common, RM18 8UL. Planning permission is being sought to include for a gas turbine electricity station and a battery storage centre.

This survey has utilized standard methods for checking for reptiles, by placing out felts, tins or carpet tiles across the site. These are then checked in suitable weather for reptiles. Whilst checking the felts the surveyor also looks for reptiles moving around the site.

The inspection(s) was conducted on the 05/04/2017, 12/04/2017, 19/04/2017, 25/04/2017, 04/05/2017, 10/05/2017, 17/05/2017and 31/05/2017.

The survey can only ever provide a 'snap shot' of the site at the time of the survey and circumstances may change following this report. Health and Safety restrictions or obstructions may limit the ability to find reptiles e.g. flooding.

Biological records have been requested to give the report context and allow a study of the surrounds. The information is often sensitive and therefore a synopsis is provided and the full data released separately for verification.

The survey can be conducted between March to October when temperatures of between 9-18°C are generally accepted to be the optimum for reptiles to be active. These months are generally considered optimal for observing active reptiles, except the warmest summer months (where temperatures can exceed 18°C, which are considered sub-optimal).

Summary of legislation and National Planning Policy that protects bats in England:

- Wildlife and Countryside Act 1981 as amended.
- Countrywide and Rights of Way Act 2000.
- Natural Environment and Rural Communities Act 2006.
- National Planning Policy Framework ("NPPF").
- Circular 06/05.

This legislation makes it illegal to:

- Intentionally or deliberately kill or injure **common** and **rare** reptiles.
- Deliberately disturb or capture **rare** reptiles.
- Damage, destroy or obstruct access to **rare** reptile habitat.
- Possess or transport a **rare** reptile or any part of a **rare** reptile, unless acquired legally.
- Sell, barter or exchange **common** and **rare** reptiles.

Rare reptile species are found in highly restricted ranges in the south east of England and receive full European protection. There are populations of sand lizard in e.g. coastal Wales and Cornwall. Smooth snake populations are found in lowland heaths in e.g. Surrey.

2.0 Methods

The survey follows the national guidelines, which is taken as following: -

- Froglife (1999). Reptile Survey. Froglife Advice Sheet 10. Froglife, Halesworth.
- Herpetofauna Groups or Britain and Ireland (1998). Evaluating local mitigation/translocation programs: Maintaining Best Practice and Lawful Standards. HGBI.
- JNCC (2004). Common Standards Monitoring Guidance for Reptiles and Amphibians.
- Edgar et al (2010). Reptile Habitat Management Handbook. Amphibian and Reptile

The survey consists of pacing out felts, tin or carpet tiles across the site. These are then checked for reptiles in suitable weather and notes made of the species, sex and age.

From this information an estimate of the population can be made e.g. more than 5 slow worm on the site would be a good population.

If a deviation from the guidelines has been made the reason and justification will be explained below: -

No deviation from the standard guidelines has been made for this survey.

3.0 Results

The following section details the results of the desk study, inspection and survey, it includes MAGIC information, biological records data and map/aerial photo information.

3.1 Desk Study

The desk study is centred on Grid Ref – TQ663770 and postcode – RM18 8UL (nearest to site).

Table 1: Weather records –

Date	Survey	Weather: Start	Weather: Finish
05/04/2017	Set-up	Temp: 16 ℃ Cloudy: 20% Wind: 0/8 Rain: None	Temp: 16 ℃ Cloudy: 10% Wind: 1/8 Rain: None
12/04/2017	1	Temp: 12 ℃ Cloudy: 20% Wind: 0/8 Rain: None	Temp: 14 ℃ Cloudy: 35% Wind: 0/8 Rain: None
19/04/2017	2	Temp: 12 ℃ Cloudy: 20% Wind: 0/8 Rain: None	Temp: 14 ℃ Cloudy: 10% Wind: 0/8 Rain: None
25/04/2017	3	Temp: 11 ℃ Cloudy: 40% Wind: 0/8 Rain: None	Temp: 12 ℃ Cloudy: 40% Wind: 0/8 Rain: None
04/05/2017	4	Temp: 13 ℃ Cloudy: 70% Wind: 0/8 Rain: None	Temp: 14 ℃ Cloudy: 80% Wind: 0/8 Rain: None
10/05/2017	5	Temp: 15 ℃ Cloudy: 60% Wind: 1/8 Rain: None	Temp: 15 ℃ Cloudy: 60% Wind: 0/8 Rain: None
17/05/2017	6	Temp: 16 ℃ Cloudy: 100% Wind: 1/8 Rain: None	Temp: 18 ℃ Cloudy: 100% Wind: 1/8 Rain: None

31/05/2017	7	Temp: 19 ℃ Cloudy: 0% Wind: 1/8 Rain: None	Temp: 21 C Cloudy: 0% Wind: 1/8 Rain: None

Magic:

The following statutory sites have been located on the search (see Figure 1)–

- There are no SSSI's or EPS licenses issued within the search area. However there is a great crested newt license found just outside of the 2km radius to the north and Mucking Flats and Marshes SSSI is found to the east.

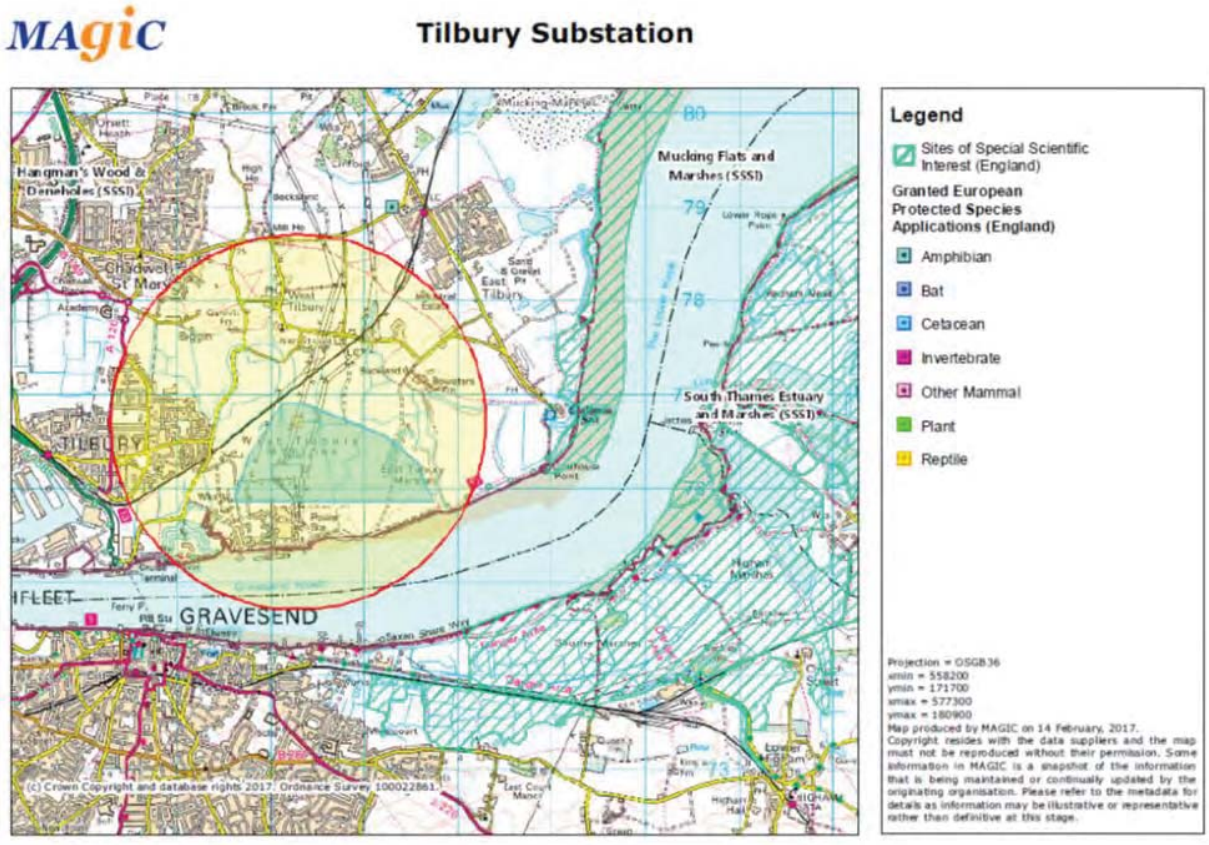


Figure 1: Magic search

Biological Records Data:

A 2km data search of existing records for protected species and nature reserves has been commissioned, below details the results and site context:

Biological records have been ordered from Essex Records Centre (ERC, 2017). There are two local wildlife sites close to the site of development, with a further four well outside 1km of the site. The first of these is known as Lytag Brownfield Site and it sits approx. 200m to the west of the site. Survey works undertaken on the site has shown there to be a good population of common reptiles present, including slow –worm, common lizard, adder and grass snake. The second is known as The Tilbury Centre located approx. 500m southwest of the site. It is designated for a complex mosaic of grassland, flower-rich early successional/pioneer vegetation, ditches, a small reedbed and a pond, notable for its colony of Stonewort *Chara sp*. and the nationally rare (Red Data Book) Great Silver Beetle *Hydrophilus piceus*. The pioneer vegetation includes abundant Bird's-foot Trefoil Lotus corniculatus, on which the national BAP bumblebees *Bombus humilis* forages. Other important invertebrates have also been recorded here.

Species information is lacking from the area, with only seven records, three of which are for badger. The others include bluebell and three butterfly records.

Site Location and Surrounds:

The site is located in Essex, Tilbury and is surrounded by arable fields in the immediate local. Table 2 details the commuting, feeding and habitat features in a 1km radius of the site.

Table 2: Habitat features suitable for reptile use

Feature	Description
Water course	The river Thames is located approx. 600m to the south of the site. There are many agricultural drainage ditches within the surrounds.
Water bodies	A large pond is located to the west of the site, approx. 100m from the boundary.
Woodland	No true woodland is located within 2km of the site, however small area of scrubby woodland is found scattered across the landscape.
Linear e.g. hedgerows	Defunct agricultural hedges are found scattered across the landscape in all directions.
Pasture/arable	The dominant land-use in the area is arable with grazed fields to the north.
Other	A railway line runs east/west to the north of the site.

3.2 Observations

Table 3: Results and observations of the surveyors' checks (see Figure 4 for tile locations)

Surveyor	Felt	Survey	Reptile Activity Observed
MOC/TOC/ JOC	N/A	Set-up	No reptiles observed.
MOC/TOC	12 63 67 71 75 88 125 137 138	1	2 x male slow worm found, one under felt 12 and 125. 9 x common lizard (males) on and under felts 12, 63, 67, 71, 75, 88, 137 and 138.
TOC/JOC	5 6 8 12 16 31 40 44 45 46 64 66 88 94 96 130	2	5 x slow worm, 4 female and 1 male. Found under felts 5, 6, 12, 16 and 46. 11 x common lizard (10 male) and 1 (female), found under felts 8, 31, 40, 44, 45, 46, 64, 66, 88, 94, 96, 130.
DR	9 27 40 50 58 59 72 74 100 105 107 125	3	Common Lizard under mats 27, 72, 100. Common Lizard basking on top of mats 9, 40, 50, 58, 59, 74, 105, 107, 125. Female Slow Worm under mat 18, 59, 68, 96, 117, 124, 125. Juvenile. Slow Worm under mat 16. New born Slow Worm under mat 86. Juvenile Common Lizard under 86
MOC/TOC	1 5 6 11 12 18	4	4 x Juvenile slow worms under mat 1, 5, 68, and 101. 8 x Male slow worm under mats 11, 12, 22, 24, 124, 116, 96, 86. 5 Female slow worm under mats 6, 18, 86 1 x Juvenile common lizard under mat 100 2 x female common lizard under mats 66 and 88 2 x male common lizard under mats 38 and 81

	22 24 38 66 68 81 83 86 96 100 101 116 124 126		Under mat 126 an unidentified common lizard was found.
DR	6 62	5	2 adult females under mat 6 1 juvenile common lizard under mat 62.
MOC/TOC	18 20 29 31 34 36 38 40 42 46 47 50 58 62 70 82 83 90 93 95 96 98 106 119 125	6	4 x juvenile slow worm under matts 31, 34, 47, and 90 6 x female slow worm under matts 42, 119, 98, 90, 93, and 95 2 x male slow worm under matts 98, and 82 7 x juvenile common lizard 20, 29, 38, 40, 50, 70, and 83 2 x female common lizard under matts 18, and 36 6 x male common lizard under matts 46, 58, 125, 106, 62, and 96 A single common lizard seen between matts 119 and 120
MOC/TOC	2 3 4 5 17 20 35 65 68 124	7	A single male slow worm under tiles 2 and 20. 2 male slow worm under tile 3. Female slow worm under tiles 4 and 5 (see Figure 3). Juvenile slow worms under tiles 4 and 68 A single common lizard was basking on tile 124, it could not be sexed as it moved away too quickly. A single juvenile adder was found under tile 17 (see Figure 2). A single grass snake juvenile under tile 65
Total population of individual species based on any one count – Common lizard – 18 total individuals found on check 6			

Slow worm – 17 total individuals found on check 4
Adder – 1 total individual found on check 7
Grass snake – 1 total individual found on check 7



Figure 2: Adder under tile 17



Figure 3: Example of slow worm

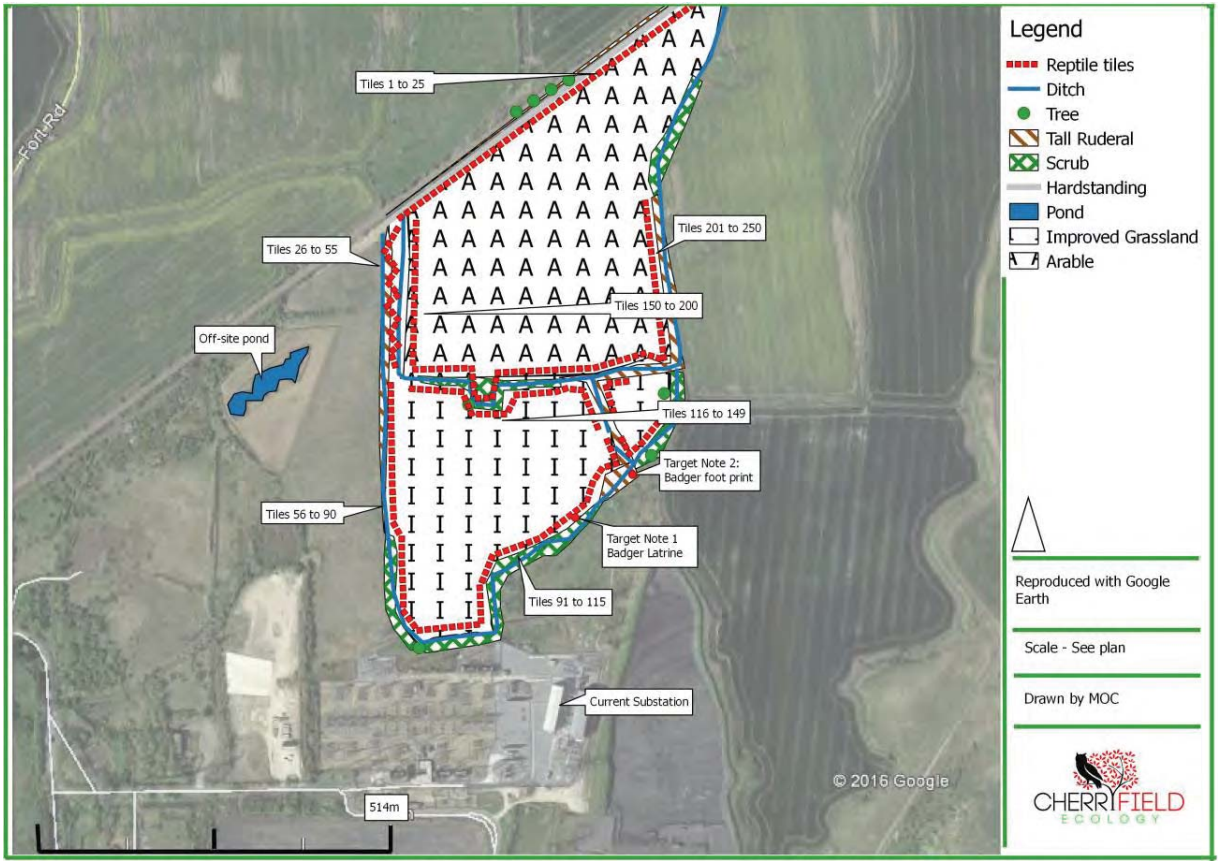


Figure 4: Site plan (tile locations)

4.0 Conclusions, Discussion and Recommendations

The following section details the conclusions, discussion and recommendations in the context of the proposed works.

Conclusion and Discussion

The development will involve building a new gas turbine centre and battery storage site. This is large infrastructure project involving a large area of the site. All four common reptile species have been found to be using the site, which includes adder, grass snake in low numbers (one of each being found, although both juvenile suggesting adults will be present) and good populations of both common lizard and slow worm.

Potential Impact

All four species will be impacted by the development with a loss of habitat. Un-mitigated works could result in common reptiles being killed.

Recommendations

As common reptiles are protected under the Wildlife and Countryside Act 1981 (as amended) the normal methodology to protect reptile populations is by trapping and moving reptiles to a receptor site either elsewhere or on site. Therefore the following must be followed in order to allow the development to proceed -

- A semi-permanent reptile fence will be installed that consists of a 1x850mm sheet of recycled HDPE plastic. The plastic is buried to a depth of 200mm. The plastic sheet is scored 100mm in from the base to allow for the creation of a 100mm underground return. Alternatively the plastic can be buried vertically to 300mm with no underground return. The plastic sheet is semi rigid so requires support. This is provided by 50x50x1000mm tanalised timber stakes. The sheet is fixed to the stakes using 35mm screws (3 No. per post). The plastic is scored 50mm in from the top edge. This allows for folding and the creation of an overhang to further prevent the passage of reptiles (see Figure 5)

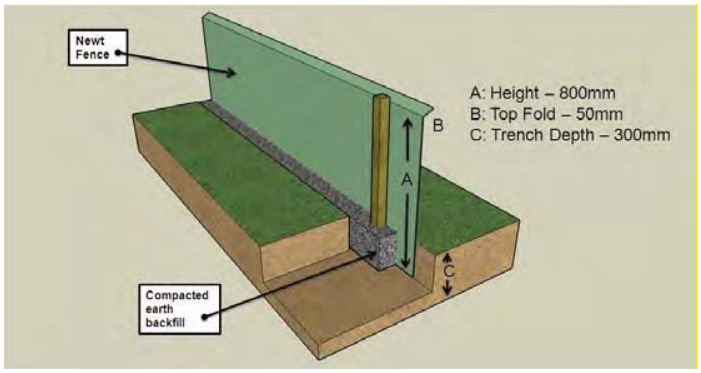


Figure 5: Example of reptile fence

- Where vehicle access is required into the trapping area, a grid shall be installed to allow the free passage of vehicles. This consists of two 5m RSJs set into a concrete beam with a gap between them. Exit points are provided at the end of the grid to allow any animals that fall into the void between the two RSJs to escape/move back into the site (see Figure 6).

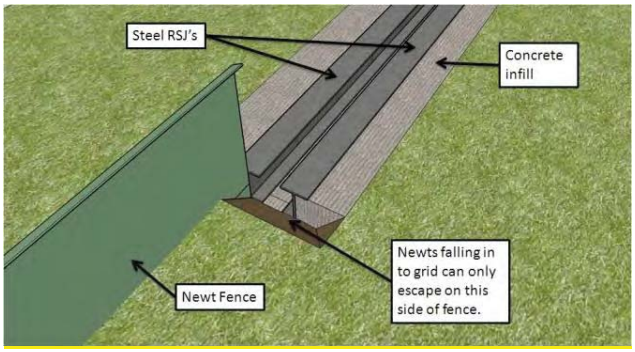


Figure 6: Example of vehicle access

- Pitfall traps will be constructed from 10l plastic containers/buckets with snap on lids sunk into the ground along the inner perimeter of the fenced area. The containers will be sunk flush to the ground level and with their outer edge flush against the UPVC fencing. The traps will be set at 1 trap per 10m length of fence where it is possible to do so. If necessary, small tile refugia will be used where pitfall traps cannot be placed.
- All pitfall traps will be designed to minimise any impacts upon animals that may fall into them. Vegetation will be provided as cover in the bottom of the trap and drainage holes will be created to avoid a build-up of water in the trap that could lead to drowning of animals.

- Mammal ladders will be positioned in the trap to allow any small mammals captured an escape route. A small piece of timber, stick or plant stem may be used.
- All pitfall traps will be checked regularly during a 24 hour period and will be checked at least twice a day between 0600 and 1100 hrs and 1700 and 1900 hrs.
- In addition, artificial refugia (felt/carpet/tins) will be deployed in areas to be trapped in locations assessed as being most likely to attract animals (i.e. breaks in the habitat and near to obvious topographical features e.g. south facing slopes).
- A minimum of 90 trapping days in suitable weather will be required, followed by 5 clear days of trapping.
- Once the site has been deemed clear of reptiles by the ecologist, habitat manipulation will be used to clear the site fully of any final reptiles that have not been trapped.
- This will involve cutting the grass area to a level no higher than 50mm from the centre of the site out to the edges leaving a 0.5m buffer around the reptile fence in order to capture the remaining reptiles.
- After the final trapping session the remaining buffer can be cut to a height of no more than 50mm.
- The reptile fence will remain in place and intact until the works are then completed.

5.0 References

Froglife Advice 'Sheet 10' Reptile Survey. An introduction to planning, conducting + interpreting surveys for snake + lizard conservation.

Office of the Deputy Prime Minister (2005a). Planning Policy Statement 9: Biodiversity and Geological Conservation. London: HMSO.

Paul Edgar, Jim Foster and John Baker (2010). Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth

Records: Essex Records Centre, (2017) Records Data, ERC

Office of the Deputy Prime Minister (2005). Circular 06/2005: Biodiversity and Geological Conservation. Para.99

DNA Analysis Report - Commercial in Confidence

Customer:	Cherryfield Ecology
Address:	105 Turners Road South Luton Luton Bedfordshire LU2 0TG
Contact:	Martin O'Connor
Email:	[redacted]
Tel:	[redacted]
Report date:	11-May-2017
Order Number:	GCN17-0415
Samples:	Pond Water
Analysis requested:	Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:
The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

Positive:	DNA from the species was detected.
eDNA Score:	Number of positive replicates from a series of twelve.
Negative:	DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive:	Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

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DNA Analysis Report - Commercial in Confidence

CustomerReference	Fera Reference	GCN Detection	GCN Score	Inhibition	Degradation
Pond - Tilbury	S17-004666	Inconclusive	0	No	YES
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ditch	S17-004548	Negative	0	No	No

The results indicate that eDNA for great crested newts was not detected in any of the samples submitted.

However, with sample S17-004666 we detected degradation of the internal control. Therefore, due to the risk of any eDNA also being degraded resulting in a false negative, we have issued an inconclusive result.

Analysis was conducted in the presence of the following controls: 1) Extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs, and was performed under the conditions of licensing arrangements with Applied Biosystems and patent rights owned by F. Hoffman-La Roche Ltd.

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Appendix D: 2018 Ecological Survey and Outline Mitigation Report

[Note: the figures and zones in this appendix show the potential development boundary at the time of undertaking baseline ecological surveys. Subsequently, evolution of the development design has led to some zones being removed from the boundary or reduced in extent, and other potential development zones added, which are described in the body of the EIA Scoping Report.

Zone lettering in this appendix and its figures therefore differs from that used in the EIA Scoping Report and its figures.

This appendix details surveys of the zones to date. It will be extended where necessary for additional land within the development boundary following further survey, in the course of the EIA process.]

THURROCK FLEXIBLE GENERATION PLANT: ECOLOGICAL SURVEYS AND OUTLINE MITIGATION

THURROCK FLEXIBLE GENERATION PLANT: ECOLOGICAL SURVEYS AND OUTLINE MITIGATION 2018

July 2018

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Project Number/Document Reference:	**ECO00110-R-002d**
Client:	**Thurrock Power Ltd**

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To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the degree or extent of e.g. species abundances or habitat management efficacy described in the report.

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1 INTRODUCTION

Background to the study

1.1 RPS were commissioned by Thurrock Power Ltd to undertake a suite of ecological surveys to inform an Ecological Impact Assessment (EcIA) of a proposed Flexible Generation Plant at Tilbury, Essex.

1.2 An initial ecological scoping exercise was undertaken concurrently with the Phase 1 habitat survey to establish the requirement for detailed surveys. This was also informed by discussion with Jonathan Bustard of Natural England, undertaken via Natural England's Discretionary Advice Service (DAS).

1.3 The following surveys were undertaken in 2018:

- Desk study
- Phase 1 habitat survey
- Botanical survey of Common Land which forms part of the Main Site
- Invertebrate scoping survey of common land which forms part of the Main Site
- Great Crested Newt (GCN) eDNA surveys
- Reptile surveys
- Breeding bird surveys
- Water Vole surveys
- Badger surveys

Development proposals

1.4 The proposed development comprises the construction and operation of:

- reciprocating gas engines with rated electrical output totalling 600 MW;
- batteries with rated electrical output of 150 MW and storage capacity of up to 600 MWh;
- gas, electricity and cooling water connections, private access road and minor public highway widening for delivery of large loads;
- designation of replacement common land (exchange land) and possible creation of habitat for protected species translocation; and
- possible transfer of land to Thurrock Council for planning gain.

1.5 The land within the application boundary comprises the Main Site on which the gas engines and batteries would be built, and further land for access, gas, electricity and cooling water connections, replacement common land and biodiversity enhancement.

Aims and objectives

1.6 The aims and objectives of the surveys and this report were to:

- identify whether the site supported any habitats of conservation significance;
- identify whether the site supported any protected species or species of particular conservation concern;
- establish a robust baseline of ecological information to inform an EcIA as part of the Environmental Impact Assessment (EIA) process;
- provide information on potential impacts of the development proposals; and
- make recommendations for ecological mitigation and enhancement.

Study area

1.7 The proposed Main Site is located on land south west of Station Road near Tilbury, Essex, and comprises undeveloped land with no current buildings.

1.8 The British National Grid coordinates are TQ 662 766 and the nearest existing postcode is RM18 8UL.

1.9 The whole application site is approximately 182 ha in size of which around 18 ha is the main development site. The main development site is approximately 800 m east of the edge of Tilbury, with its immediate surroundings being agricultural land save for the National Grid 275/400 kV Tilbury Substation immediately to the south and railway line passing through the application site boundary to the north of the main development site.

1.10 The main development site currently comprises open fields crossed by three overhead power lines with steel lattice electricity pylons. It is immediately to the north of the existing Tilbury Substation and site of the decommissioned Tilbury coal fired power station, with the River Thames further to the south. Substantial development is envisaged in the area with the proposed extension of Tilbury Port to the west, redevelopment of Tilbury Power Station, and Lower Thames Crossing among other proposals.

1.11 The southern part of the main development site is known as Walton Common (registered common land number CL228). It forms part of the common known as The Green, Hall Hill, Fort Road, Parsonage, Walton and Tilbury Fort Commons (ID 33611).

1.12 The other land within the application boundary generally comprises arable fields separated by drainage channels and some man-made ponds.

1.13 The study area is shown on Figure 1.1. The study area has been divided into zones, as outlined below.

Zone A: The Main Site for flexible generation plant construction. Currently comprises arable land and Walton Common, an area of semi-improved grassland currently managed by mowing.

Zone B: The existing Tilbury substation where the electrical connection will be made.

Zone C: Predominantly arable land corridor for access road and gas connection

Zone D: Arable field corridor for a direct gas connection option.

Zone E: Grassland field within which connection to the high-pressure gas main may be made.

Zone F: Arable field – primary area for habitat creation and exchange common land.

Zone G: Improved grassland field – secondary area within which exchange common land could be provided.

Zone H: Construction access using existing roads but requiring minor works.

Zone I: Existing Common Land (improved grassland)

Zone J: No longer within Application Boundary (grassland, scrub)

Zone K: Improved grassland – possible planning gain land.

1.14 **Note that the figure and zones show the potential development boundary at the time of undertaking surveys to date. Subsequently, evolution of the development design has led to some zones being removed from the boundary or reduced in extent, and other potential development zones added. (These can be seen in Figure 2 of the RPS EIA Scoping Report, reference OXF10872 July 2018; note that zone lettering in this report and Figure 1.1 therefore differs from that used in the EIA Scoping Report and its figures.) This report details surveys of the zones to date. It will be extended for additional land within the development boundary following further survey, in the course of the EIA process.**

1.15 Specifically, Zone J in Figure 1.1 was included for potential access options that are now not being pursued. Results from surveys pertaining to this zone have still been included in this report as they provide useful additional contextual survey information for the site.

1.16 Initial recommendations for ecological mitigation and enhancement are outlined in this report and will be further developed during the EIA process and as design of the proposed development is progressed.

Relevant legislation

1.17 A summary of legislation relevant to the species covered in this report is provided in Appendix A.

2 DESK STUDY

Introduction

2.1 Ecological records within a 2km radius of the red line boundary comprising Zones A-K (as summarised in Section 1.13 and shown on Figure 1.1) were requested from the Essex Wildlife Trust Biological Records Centre and the Kent and Medway Biological Records Centre. Data requests were limited to records for protected species recorded within the last ten years and sites of nature conservation interest within 2 km of the site. This included a review of existing statutory sites of nature conservation interest, such as Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), Special Area of Conservation (SACs) and National Nature Reserves (NNRs), and non-statutory sites, such as Sites of Importance for Nature Conservation (SINCs) and Local Wildlife Sites (LWSs).

2.2 Locations of statutory designated sites were accessed via the government 'MAGIC' website (MagicMap, accessed 2018).

2.3 A 1:25,000 OS map was used to identify nearby features such as ponds or green corridors that could provide habitat or connectivity to other areas.

Results

Designated sites

2.4 There are four statutory designated sites for nature conservation value within 2 km of the site. Mucking Flats and Marshes SSSI is located 0.77 km, Thames Estuary and Marshes SPA and Ramsar is located 1.03 km, and Linford Wood LNR is located 1.55 km east of the site.

2.5 Several non-statutory sites are located within the 2km search radius of the site. Two of these are located within the red line boundary of the site: Tilbury Marshes, an Essex Local Wildlife Site and Lytag Brownfield, an Essex Local Wildlife Site. Another five Essex Local Wildlife Sites are located adjacent to the red line boundary: Broom Hill, Low Street Pit, West Tilbury Church, West Tilbury Hall and Mucking Heath.

2.6 Another eleven non-statutory sites are located within the 2 km search radius of the site.

2.7 A summary of these sites is provided in Table 2.1 below and the location of each site is detailed in Figure 2.1.

Table 2.1. Designated sites within 2 km of the study area

Site name	Type	Approx. area (ha)	Interest Features	Distance from site (km)
Statutory Sites				
Thames Estuary	rMCZ	11174	The site is an important corridor for European Eels and Smelt. It is also an important fish nursery and spawning ground, and the best site in the region for Tentacled Lagoon Worm (*Alkmaria romijni*).	0.33
Mucking Flats and Marshes	SSSI	312.7	Nationally and internationally important numbers of wintering wildfowl and waders occur on an extensive stretch of mudflats, saltmarsh, and sea wall grassland. Saltmarshes provide important high tide roosts and have a high invertebrate interest. The site's value is enhanced by its proximity to two SSSI sites across the Thames in Kent.	0.77
Thames Estuary and Marshes	Ramsar	5589	The site supports internationally important numbers of wintering waterfowl, on a complex of mudflats, lagoons and saltmarshes. The saltmarsh areas comprise internationally important diverse assemblages of wetland plants and invertebrates. The site is also noted for its hydrological functions, including shoreline stabilisation.	1.03
Thames Estuary and Marshes	SPA	4838.9	The estuary and adjacent grazing marsh support important assemblages of wintering water birds, and is also important in spring and autumn migration periods.	1.03
Linford Wood	LNR	3.46	The woodland provides habitat for birds, including refuge for migrant birds in spring and autumn.	1.55
Non-statutory Sites				
Lytag Brownfield	LWS	12.4	Site supports populations of all four Essex reptile species.	0.00
Mucking Heath	LWS	50.5	Relict acid-grassland/heath is of interest for flora and invertebrates. Insect fauna includes 4 nationally rare and 50 nationally scarce species.	0.00
Tilbury Marshes	LWS	39.8	Grazing marsh supports a number of nationally scarce plants, area also includes important habitat for invertebrates	0.00
West Tilbury Hall	LWS	2.5	Locally important grassland flora includes 2 locally rare species, and supports the nationally scare bee *Osimia bicolor*	0.00
Low Street Pit	LWS	3.5	Site lies on regionally important Thames terrace gravels, supports diverse invertebrate fauna.	0.00

Site name	Type	Approx. area (ha)	Interest Features	Distance from site (km)
Broom Hill	LWS	11.3	Site is of interest for ancient acid-grassland flora, and invertebrate fauna is of exceptional important. Seven nationally rare and 39 nationally scare species have been recorded.	0.02
Tilbury Centre	LWS	2.8	Site comprises a complex mosaic of habitats, supporting important invertebrates and BAP bumblebee *Bombus humilis* foraging habitat.	0.11
Goshems Farm	LWS	74	Site supports populations of Stinking Goosefoot (*Chenopodium vulvaria*), and UKBAP species Hornet Robberfly (*Asilus crabroniformis*)	0.42
Orsett Camp Quarry	LWS	8.6	Acid grassland supports important invertebrate populations, including 6 nationally rare, 16 nationally scarce and 3 UKBAP species. The site also supports populations of reptiles, and nationally scarce plant species.	0.47
Rainbow Shaw	LWS	2.2	Small ancient woodland fragment supporting populations of Glow-worm, and Bluebell.	0.70
Linford Pit	LWS	14.3	Site supports important invertebrate fauna, and lies within significant cluster of similar sites.	0.95
Terrels Heath	LWS	2.5	Area of ancient woodland dominated by Pendunculate Oak (*Quercus robur*).	1.62
Linford Wood	LWS	3.2	Part of LNR, woodland contains a pond and interesting tall herb fen.	1.65
Buckingham Hill	LWS	22.9	Large extent of unimproved acid grassland developing, including foraging habitat for *Bombus humilis*	1.67
Restored Canal & Grazing Marsh, Higham	LWS	58.6	Recently established reedbeds and coastal grazing marsh.	1.73
Gobions Lake	LWS	19.1	Mosaic of habitats with diverse flora and fauna. Peripheral woodland contains a rookery.	1.79
Blackshots Nature Area	LWS	18.7	Large area of rough grassland supporting an important invertebrate population and nesting birds.	1.99

Abbreviations used in Table 3.1: **rMCZ**: recommended Marine Conservation Zone; **SPA**: Special Protection Area; **SSSI**: Site of Special Scientific Interest; **LNR**: Local Nature Reserve; **LWS**: Local Wildlife Site; **ha**: hectare.

Species

2.8 Records of protected species were obtained from the Essex Wildlife Trust Biological Records Centre and the Kent and Medway Biological Records Centre. A number of species of conservation importance or otherwise notable were recorded within the 2km search radius of the site. A summary of these records is provided in Table 2.2.

2.9 In order to simplify the results, only records of species from the last 10 years are shown. In addition, only data with a 6-figure grid reference resolution or higher are provided, since locations given at a lower resolution do not allow accurate calculation of distance to the site boundary.

Table 2.2. Species records from the last 10 years within 2 km of the site

Common Name	Scientific Name	Nearest Distance from site (km)	Year of most recent record	Conservation Status
Plants				
Bluebell	*Hyacinthoides non-scripta*	0.76	2016	WAC8, RedList_LC
Common Cudweed	*Filago vulgaris*	1.65	2016	RedList_NT
Pyramidal Orchid	*Anacamptis pyramidalis*	1.50	2016	RedList_LC
Invertebrates				
Brown-banded Carder Bee	*Bombus humilis*	1.57	2015	NERC41, UKBAP
Cinnabar	*Tyria jacobaeae*	0.11	2017	NERC41, UKBAP
	Cosmobaris scolopacea	0.15	2015	RedList_R
Dusky Thorn	*Ennomos fuscantaria*	0.84	2016	NERC41, UKBAP
Hornet Robberfly	*Asilus crabroniformis*	0.84	2016	NERC41, UKBAP, RedList_LC, NN
Latticed Heath	*Chiasmia clathrata*	0.74	2008	NERC41, UKBAP
	Melanobaris laticollis	0.47	2014	NN
	Otiorhynchus (Otiorhynchus) raucus	0.47	2014	NN
Shaded Broad-bar	*Scotopteryx chenopodiata*	0.84	2016	NERC41, UKBAP
Shrill Carder Bee	*Bombus (Thoracobombus) sylvarum*	0.06	2016	NERC41, UKBAP, NN
Small Heath	*Coenonympha pamphilus*	0.15	2013	NERC41, UKBAP, RedList_NT
Wall	*Lasiommata megera*	0.02	2016	NERC41, UKBAP, RedList_NT
White-letter Hairstreak	*Satyrium w-album*	0.87	2013	WCA5:9.5a, NERC41, UKBAP, RedList_EN
Amphibians				
Common Toad	*Bufo bufo*	0.84	2016	Bern3, WCA5:9.5a, NERC41, UKBAP

Common Name	Scientific Name	Nearest Distance from site (km)	Year of most recent record	Conservation Status
Great Crested Newt	*Triturus cristatus*	1.89	2012	Bern2, UKBAP, WCA5:9.5a, WCA5:9.4b, WCA5:9.4c, HabDir2, HabDir4, NERC41, RedList_LC, HabRegs2
Marsh Frog	*Pelophylax ridibundus*	1.57	2009	Bern3
Smooth Newt	*Lissotriton vulgaris*	0.29	2017	WCA5:9.5a, Bern3, RedList_LC
Birds				
Blackbird	*Turdus merula*	1.65	2016	BD2.2, RedList_LC
Black-headed Gull	*Chroicocephalus ridibundus*	1.65	2016	BD2.2, CMS2, Birds:Amber, RedList_LC
Blue Tit	*Cyanistes caeruleus*	1.65	2016	Bern2, RedList_LC
Canada Goose	*Branta canadensis*	0.84	2016	BD2.1, CMS2
Carrion Crow	*Corvus corone*	1.96	2012	BD2.2, RedList_LC
Cetti's Warbler	*Cettia cetti*	1.65	2016	WACA1i, RedList_LC
Common Gull	*Larus canus*	1.65	2016	BD2.2, CMS2, Birds:Amber, RedList_LC
Coot	*Fulica atra*	1.65	2016	BD2.1, CMS2, RedList_LC, RedListGB_NT
Cormorant	*Phalacrocorax carbo*	1.84	2016	CMS2, RedList_LC
Cuckoo	*Cuculus canorus*	0.26	2012	RedList_LC, NERC41, Birds:Red, UKBAP
Curlew	*Numenius arquata*	1.58	2016	Birds2.2, CMS2, NERC41, UKBAP, Birds:Red, RedList_NT
Dunnock	*Prunella modularis*	1.65	2016	Bern2, Birds:Amber, RedList_LC
Gadwall	*Anas strepera*	1.65	2016	BD2.1, CMS2, Birds:Amber, RedList_LC
Goldeneye	*Bucephala clangula*	1.65	2016	CMS2, BD2.2, WCA1ii, Birds:Amber, RedList_LC, RedListGB_VU
Goldfinch	*Carduelis carduelis*	0.48	2016	Bern2, RedList_LC
Great Crested Grebe	*Podiceps cristatus*	1.65	2016	CMS2, RedList_LC
Great Tit	*Parus major*	1.65	2016	Bern2, RedList_LC
Green Woodpecker	*Picus viridis*	1.65	2016	Bern2, RedList_LC
Greenfinch	*Chloris chloris*	1.96	2016	Bern2, RedList_LC
Greylag Goose	*Anser anser*	0.84	2016	BD2.1, CMS2, WCA1ii, Birds:Amber, RedList_LC
Jay	*Garrulus glandarius*	1.96	2012	BD2.2, RedList_LC
Kestrel	*Falco tinnunculus*	0.48	2015	Bern2, CMS2, EC CITES A, Birds:Amber, RedList_LC
Kingfisher	*Alcedo atthis*	0.84	2016	BD1, Bern2, WCA1i, Birds:Amber, RedList_LC

Common Name	Scientific Name	Nearest Distance from site (km)	Year of most recent record	Conservation Status
Little Gull	*Hydrocoloeus minutus*	1.96	2015	Bern2, WCA1i, CMs, BD1, RedList_LC
Little Owl	*Athene noctua*	1.96	2012	Bern2, EC CITES A, RedList_LC
Magpie	*Pica pica*	1.65	2016	BD2.2, RedList_LC
Mallard	*Anas platyrhynchos*	1.65	2016	BD2.1, CMS2, Birds:Amber, RedList_LC
Marsh Harrier	*Circus aeruginosus*	1.95	2017	BD1, CMS2, EC CITES A, RedList_LC, Birds:Amber
Meadow Pipit	*Anthus pratensis*	0.48	2015	Bern2, Birds:Amber, RedList_LC
Pied Wagtail	*Motacilla alba*	1.96	2012	Bern2, RedList_LC
Pochard	*Aythya ferina*	1.65	2016	Bern2, RedList_LC
Reed Bunting	*Emberiza schoeniclus*	0.48	2015	Bern2, NERC41, UKBAP, Birds:Amber, RedList_LC
Ring-necked Parakeet	*Psittacula krameri*	0.48	2016	EC CITES C
Robin	*Erithacus rubecula*	0.84	2016	Bern2, RedList_LC
Rock Pipit	*Anthus petrosus*	1.96	2012	Bern2, RedList_LC
Sand Martin	*Riparia riparia*	0.84	2016	Bern2, RedList_LC
Scaup	*Aythya marila*	1.65	2016	BD2.2, CMS2, WCA1i, NERC41, UKBAP, Birds:Red, RedList_LC
Shoveler	*Anas clypeata*	1.65	2016	BD2.1, CMS2, EC CITES C, Birds:Amber, RedList_LC
Skylark	*Alauda arvensis*	0.48	2015	BD2.2, NERC41, Birds:Red, RedList_LC
Stonechat	*Saxicola rubicola*	1.96	2012	Bern2, RedList_LC
Swift	*Apus apus*	0.21	2017	Birds:Amber, RedList_LC
Tufted Duck	*Aythya fuligula*	1.65	2016	BD2.1, CMS2, RedList_LC
Woodpigeon	*Columba palumbus*	1.96	2016	BD2.1, RedList_LC
Wren	*Troglodytes troglodytes*	1.96	2012	Bern2, RedList_LC
Terrestrial Mammals				
Brown Long-eared Bat	*Plecotus auritus*	1.09	2009	Bern2, WCA5:9.5a, WCA5:9.4b, WCA5:9.4c, CMS2, HabDir4, EUROBATS, NERC41, UKBAP, HabRegs2, RedList_LC
Common Pipistrelle	*Pipistrellus pipistrellus*	0.23	2012	Bern2, Bern3, WCA5:9.5a, WCA5:9.4b, WCA5:9.4c, CMS2, HabDir4, EUROBATS, HabRegs2, RedList_LC
European Water Vole	*Arvicola amphibius*	1.23	2016	WCA5:9.5a, WCA5:9.4b, WCA5:9.4c, NERC41, UKBAP, RedList_LC

Common Name	Scientific Name	Nearest Distance from site (km)	Year of most recent record	Conservation Status
Natterer's Bat	*Myotis nattereri*	0.92	2015	Bern2, WCA5:9.5a, WCA5:9.4b, WCA5:9.4c, CMS2, HabDir4, EUROBATS, HabRegs2, RedList_LC
Noctule Bat	*Nyctalus noctula*	0.23	2012	Bern2, WCA5:9.5a, WCA5:9.4b, WCA5:9.4c, CMS2, HabDir4, EUROBATS, HabRegs2, NERC41, UKBAP, RedList_LC
Soprano Pipistrelle	*Pipistrellus pygmaeus*	0.93	2012	Bern2, WCA5:9.5a, WCA5:9.4b, WCA5:9.4c, CMS2, HabDir4, EUROBATS, HabRegs2, NERC41, UKBAP, RedList_LC
West European Hedgehog	*Erinaceus europaeus*	0.37	2016	Bern3, NERC41, UKBAP, RedList_LC
Marine Mammals				
Common Porpoise	*Phocoena phocoena*	1.55	2012	Bern2, CMS2, WCA5:9.5a, WCA5:9.4b, HabDir2, HabDir4, EC CITES A, OSPAR, NERC41, UKBAP, HabRegs2, RedList_LC
Common Seal	*Phoca vitulina*	1.03	2014	Bern3, CMS2, HabDir2, HabDir5, NERC41, UKBAP, HabRegs4, RedList_LC
Grey Seal	*Halichoerus grypus*	1.03	2015	Bern3, CMS2, HabDir2, HabDir5, HabRegs4, RedList_LC
Reptiles				
Adder	*Vipera berus*	0.06	2016	Bern3, WCA5:9.5a, WCA5:9.1, NERC41, UKBAP, RedList_LC
Common Lizard	*Zootoca vivipara*	0.06	2016	WCA5:9.5a, WCA5:9.1, Bern3, NERC41, UKBAP, RedList_LC
Grass Snake	*Natrix natrix*	0.06	2016	WCA5:9.5a, WCA5:9.1, Bern3, NERC41, UKBAP, RedList_LC
Slow-worm	*Anguis fragilis*	0.06	2016	Bern3, WCA5:9.5a, WCA5:9.1, NERC41, UKBAP

Abbreviations used in Table 2.2: **Bern2/3**: The Convention on the Conservation of European Wildlife and Natural Habitats Appendix 2/Appendix 3; **WCA1i/1ii/8/5:9.5a**: Wildlife & Countryside Act Schedule 1, part 1/ Schedule 1, part 2/Schedule 8/Schedule 5 section 9.5a; **EC CITES A/C**: The Convention on International Trade in Endangered Species Annex A/Annex C; **RedList_LC/R/NT/EN/CR**:

Global Red list status: Lower risk – least concern/Rare/Near threatened/Endangered/Critically endangered; **RedListGB_NT/VU**: Great Britain Red List status: Near threatened/Vulnerable; **BD1/2.1/2.2**: Birds Directive Annex1/Annex2.1/Annex 2.2; **CMS2**: The Convention on the Conservation of Migratory Species of Wild Animals Appendix 2; **NERC41**: Natural Environment and Rural Communities Act Section 41; **Birds:Red**: Bird Population Status: red; **Birds:Amber**: Bird Population Status: amber; **NS**: Nationally scarce; **NN**: Nationally notable; **HabDir2/4**: Habitats Directive Annex 2/4; **HabRegs2**: Conseravtion of Habitats and Species Regulations 2010 Schedule 2; **OSPAR**: OSPAR List of Threatened and Declining Species and Habitats, 2008; **EUROBATS**: Convention on Migratory Species EUROBATS Annex 1

Evaluation

Designated sites

Statutory sites

2.10 There are four statutory designated sites for nature conservation value within 2km of the site. The closest of these is Mucking Flats and Marshes SSSI, 0.77km from the site boundary. The Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar is located over 1km east from the site boundary, however, a Thames Estuary recommended Marine Conservation Zone is located 0.33 km south of the site boundary. This would incorporate the river corridor both east and west of the site boundary.

Non-statutory sites

2.11 Several non-statutory sites are located within the 2km search radius of the site. Five of these are located within the red line boundary of the site: Tilbury Marshes, Low Street Pit, West Tilbury Hall, Lytag Brownfield and Mucking Heath, all Essex Local Wildlife Sites. Broom Hill LWS is located 0.02km and Tilbury Centre LWS is located 0.11 km from the site boundary.

2.12 During the construction of the development there is potential for impacts such dust generation and noise and light impacts within these designated sites.

2.13 An assessment of impacts such as increase deposition of nutrients from traffic, noise and light post-construction on these designated sites is likely to be required.

Species

Plants

2.14 Three protected or otherwise notable plant and lower plant species have been recorded within 2 km of the Phase 1 survey area. These include Bluebell *Hyacinthoides non-scripta* which is protected under the Wildlife and Countryside Act.

Invertebrates

2.15 Several insect species with some rarity / conservation status have been recorded within 2 km of the Phase 1 survey area. Species mainly include bees, butterflies and moths.

Amphibians

2.16 Four species of amphibian have been recorded within 2 km of the Phase 1 survey area. Smooth Newts *Lissotriton vulgaris* are recorded 0.29 km, Common Toad *Bufo bufo* are located 0.84 km, the non-native species Marsh Frog *Pelophylax ridibundus* was recorded 1.57 km and Great Crested Newts *Triturus cristatus* are recorded 1.89 km from the site boundary.

Reptiles

2.17 All four common reptile species have been recorded within 2 km of the Phase 1 survey area.

Birds

2.18 A total of 44 protected or notable species of bird have been recorded within 2 km of the Phase 1 survey area. No records are held of birds on site but Swifts *Apus apus* have been recorded 0.21 km and Cuckoos *Cuculus canorus* have been recorded 0.26 km from the site boundary. In addition, several species have been recorded 0.48 km from the site boundary such as Skylark *Alauda arvensis,* Reed Bunting *Emberiza schoeniclus* and Meadow Pipit *Anthus pratensis.*

Mammals

2.19 Hedgehogs *Erinaceus europaeus* have been recorded 0.37 km from the site.

2.20 Water Voles *Arvicola amphibius* have been recorded 1.23 km from the site.

2.21 Five species of bat have been recorded within 2 km of the site boundary:

- Common Pipistrelle: 0.23 km
- Noctule Bat: 0.23 km
- Natterer's Bat: 0.92 km
- Soprano Pipistrelle: 0.93 km
- Brown Long-eared Bat: 1.09 km

3 PHASE 1 HABITAT SURVEY

Introduction

3.1 The ecological appraisal consisted of two components: a Phase 1 Habitat survey and a scoping survey for protected species and other species of conservation concern which could present a constraint to development.

3.2 Suitably experienced ecologists visited the site on the 23rd of May 2018 to undertake the surveys.

Methods

3.3 The Phase 1 Habitat surveys followed the standard methodology (JNCC, 2010), and as described in the Guidelines for Preliminary Ecological Assessment (IEEM, 2012). In summary, this comprised walking over the survey area and recording the habitat types and boundary features present.

3.4 A protected species scoping survey was carried out in conjunction with the Phase 1 Habitat survey. The site was assessed for its suitability to support protected species, in particular Great Crested Newts *Triturus cristatus*, reptiles, birds, Badgers *Meles meles*, bats, and other species of conservation importance that could pose a planning constraint.

3.5 The surveyors looked for evidence of use including signs such as burrows, droppings, footprints, paths, hairs, refugia and particular habitat types known to be used by certain groups such as ponds. Any mammal paths were also noted down and where possible followed. Fence boundaries were walked to establish any entry points or animal signs such as latrines. Areas of bare earth were inspected for mammal prints. Areas of habitat considered suitable for protected species or those of conservation interest were recorded.

Limitations

3.6 The ecological appraisal does not assess the presence or absence of a species, but is used to assess the potential for a habitat to support them. Where a species is seen, or there is clear and recent evidence of a species, this is reported.

3.7 The desk study is third party controlled data, purchased for the purposes of this Preliminary Ecological Appraisal only. RPS cannot be held liable for any inaccuracies in this data.

Results

3.8 The survey results are presented in the form of a map with the habitat types and boundary features marked (Figure 3.1). Photographs can be found in Appendix B.

3.9 The majority of the site comprises arable land and improved grassland, with areas of scrub, semi-improved grassland and wet ditches. A railway line runs through the centre of the site and a single pond is located on site. Tilbury Substation is also located at the very south of the site.

3.10 Descriptions of the habitat types and boundary features are detailed below. Habitat descriptions are defined by broad habitat types (JNCC, 2010).

Area A

3.11 Area A (c.18 ha) can be split into two main parts for the purpose of categorising the habitats currently present.

3.12 The northern section (c.6 ha) is a field under arable cultivation, currently a crop of Oilseed Rape *Brassica napus*.

3.13 Field Horsetail *Equisetum arvense* also occurred along the access road.

3.14 The southern section (c. 11 ha) is a uniform area of semi-improved grassland bordered by hedgerows and ditches to the north and east. Species present within this area include Yorkshire Fog *Holcus lanatus*, Rye Brome *Bromus secalinus*, Meadow Foxtail *Alopecurus pratensis*, Fescue *Festuca* sp., Common Bent *Agrostis capillaris*, Grass Vetchling *Lathyrus nissolia*, Butterbur *Petasites hybridus*, Hairy Tare *Vicia hirsuta*, Tare *Vicia* sp., Blue Field Madder *Sherardia arvensis* and Goatsbeard *Tragopogon* sp. and Field Pennycress *Thlaspi arvense*.

3.15 The hedgerows consist mainly of mature Hawthorn *Crataegus monogyna* and Bramble *Rubus fruticosus* agg. scrub.

3.16 The wet ditches are over 30cm deep and are steep-sided. Very little emergent vegetation occurred although Common Reed *Phragmites australis* dominated the banks.

3.17 Tall ruderal vegetation including Common Nettle *Urtica dioica*, Common Mugwort *Artemisia vulgaris*, Dock *Rumex* spp., Sowthistle *Sonchus* spp., Greater Burdock *Arctium lappa* and Creeping Thistle *Cirsium arvense* also occurred.

Area B

3.18 Area B comprised hard standing and buildings within the existing Tilbury Substation. This area was not surveyed as it could not be accessed, however, no priority habitats or habitats suitable for protected species are considered to be present.

Area C

3.19 This area is proposed as a potential access corridor for the site under discussion. It currently comprises arable fields of Oilseed Rape with wet ditches along field boundaries and an access track occurs along the northern boundary next to the railway line which became increasingly vegetated with improved grassland and arable weed species to the west. The plant assemblage in this area was limited and very unlikely to contain any species of high conservation value.

3.20 The field margins varied in width from 1m to 5m along the wet ditches. Species present within these areas include Barren Brome *Bromus sterilis*, Creeping Bent *Agrostis stolonifera*, Cocksfoot *Dactylis glomerata*, Meadow Grass *Poa* spp. and False Oat-grass *Arrhenatherum elatius*. Herb species include Meadow Buttercup *Ranunculus acris*, Cut-leaved Cranesbill *Geranium dissectum*, Vetch, Field Speedwell *Veronica persica*, Creeping Cinquefoil *Potentilla*

reptans, Lesser Trefoil *Trifolium dubium*, Black Medic *Medicago lupulina*, Common Storksbill *Erodium cicutarium* and occasionally Field Poppy *Papaver rhoeas*.

3.21 Some ditches did contain running water at the time of the survey but flows were low. No aquatic macrophytes were visible in any of the ditches. As on other areas of the wider site, Common Reed dominated the marginal vegetation on the banks.

Area D

3.22 This area is proposed as an option for a direct gas connection. It comprises an arable field, with mature native species hedgerows and trees around the field boundaries. Species present along the road include Hornbeam *Carpinus betulus*, Hawthorn with mature Ash *Fraxinus excelsior* and Oak *Quercus* sp. standards.

Area E

3.23 This area comprises an area of poor semi-improved grassland, with mature native species hedgerows with trees around the boundary. The habitats present within Area E are similar to those recorded in Area I.

Area F

3.24 Area F (c.9.77 ha) is a field under arable cultivation. To the east of the pond there is an area of spoil and rubble and beyond this, there is a large pond within an area of scattered trees, scrub and tall ruderal vegetation.

3.25 A wet ditch runs along the northern boundary of Area F. This is dominated by Common Reed although Yellow Iris *Iris pseudacorus* is also present. Hemlock *Conium maculatum*, Oil Seed Rape, Black Mustard *Brassica nigra* and Common Cleavers *Galium aparine* were recorded along the field boundary. A species rich hedgerow runs along the eastern boundary and comprises Hazel *Corylus avellana*, Hornbeam, Beech *Fagus sylvatica* and Elder *Sambucus nigra*.

Area G

3.26 This area comprises an area currently utilised for horse grazing. As a result, the improved grassland was very short with a longer sward along the field margins.

3.27 Within ungrazed areas, such as the north-western section of Area G, tall ruderal vegetation and scrub dominates.

Area H

3.28 This area comprises the existing road which is proposed as an access route for HGVs. Minor works will be required at pinch points along this route. The majority of the road is bordered by a narrow grass verge and mature native species hedgerows with arable land beyond. In places there is only a wooden fence or open areas of tall ruderal, poor semi-improved grassland and scrub.

3.29 The hedgerows are generally comprised of native species such as Hawthorn, Blackthorn *Prunus spinosa* and Hazel. In many areas there are large gaps or the hedgerows have been removed altogether. Management of hedgerows varied, with some being cut short (1—1.5m height) and others more unmanaged and taller.

Area I

3.30 This area comprises common land which is not currently managed or used for grazing livestock. Species were generally indicative of enriched or partially enriched conditions, with species including Ryegrass *Lolium* sp., Cocksfoot, Meadow Foxtail, Meadow Grass, Brome *Bromus* sp. and Red Fescue *Festuca rubra*.

3.31 Area I is a uniform area of improved grassland bordered by hedgerows and ditches. The high fertility of the grassland suggests a history of recent cultivation. The open ditches were similar to other parts of the site and are dominated by Common Reed. The ditch along the east and south boundaries of Area 1 are heavily vegetated with dense Blackthorn and Hawthorn scrub.

Area J

3.32 This area was initially proposed as a potential road link but will now not form part of the development boundary. The survey of this this zone is nevertheless reported here as it provides useful additional contextual survey information for the site.

3.33 Area J comprises a mosaic of mature scrub, managed poor semi-improved grassland, and small areas of woodland which could not be accessed during the survey.

3.34 The eastern section of Area J comprises rank species poor semi-improved grassland with tall ruderal and short ephemeral vegetation. Grass species include Barren Brome, Red Fescue, Crested Dogs-tail *Cynosurus cristatus*, False Brome *Brachypodium sylvaticum* and False Oat-grass. In this area, Common Reed, Tufted Hairgrass *Deschampsia cespitosa* and sedges *Carex* spp. indicate that this area retains water at certain times of year. Ruderal species such as Bristly Oxtongue *Helminthotheca echioides*, Sowthistle and Common Nettle frequently occur.

3.35 A large pond occurs in the eastern section of Area J. This pond is at present surrounded in temporary herptile fencing. Emergent vegetation present includes Common Reed, Bulrush *Typha* sp. and Reed Canary Grass *Phalaris arundinacea*.

3.36 Ragged Robin *Lychnis flos-cuculi* was a notable record south of the pond. Tall ruderal species and semi-improved grassland also occurs around the pond.

3.37 North of the pond a mature and unmanaged species-rich hedgerow occurs. This comprises Guelder Rose *Viburnum opulus*, Dog Rose *Rosa canina*, Elm *Ulmus* sp., Hazel, Hawthorn and Blackthorn with Ash, Birch *Betula* sp. and Goat Willow *Salix caprea* trees.

3.38 The centre of Area J comprises poor semi-improved grassland dominated surrounded by scattered and dense continuous scrub. Perennial Ryegrass *Lolium perenne* and Yorkshire Fog dominates this area although several herb species also occur increasing the diversity of the grassland. Species include Creeping Cinquefoil, Field Forget-me-not *Myosotis arvensis*, Yarrow *Achillea millefolium*, Common Mouse-ear *Cerastium fontanum*, Clover *Trifolium* spp., Birds-foot Trefoil *Lotus corniculatus*, Vetch and Lesser Trefoil also occur.

3.39 Within the mature Blackthorn and Hawthorn scrub, species identified includes Tufted Vetch *Vicia cracca*, Teasel *Dipsacus* sp., Rose *Rosa* spp., and large stands of Bramble are present. An access road leads into this area and hard standing occurs. *Sedum album* is present within this area as well as Buddleia *Buddleia davidii* and Goats Rue *Galega officinalis*.

3.40 Scattered Birch trees also occur. Within the woodland Oak, Ash, Field Maple *Acer campestre*, Blackthorn and Elder were identified although the vegetation. In much of the woodland the ground flora comprises dense scrub and tall ruderal vegetation.

3.41 The ditches in Area J were thickly vegetated with trees and scrub and could not be properly assessed.

Area K

3.42 This area comprises improved grassland and a road intersects the site. The area is separated by fencing and gappy species poor hedgerows into several smaller fields that are currently used for grazing ponies. Both the grassland and the hedgerows are subject to intense grazing pressure and enrichment, reducing the potential for an abundance of plant species on site.

3.43 The road verge was narrow and comprises improved grassland. Herb species recorded in this area include Catsear *Hypochaeris radicata*, Fennel *Foeniculum vulgare*, Scarlet Pimpernel *Anagallis arvensis* and Common Daisy *Bellis perennis*. Tall ruderal species such as Weld *Reseda luteola*, Dock and Hemlock were also recorded.

3.44 A wet ditch runs along the road along the boundary of Area J and Area K. This was heavily vegetated with Common Reed, tall ruderal vegetation and scrub during the survey visit.

Evaluation

Habitats

3.45 The majority of the site comprises arable fields and improved grassland of no intrinsic ecological interest.

3.46 Grasslands are an Essex Biodiversity Action Plan habitat.

3.47 Ancient hedgerows are an Essex Biodiversity Action Plan habitat and hedgerows are a UK Biodiversity Action Plan habitat. However, none of the hedgerows on site were recorded as ancient.

3.48 An extensive network of native hedgerows was present on site. The hedgerows varied in their likely ecological value, with some comprising higher numbers of species and / or with less gaps and a more varied ground flora and others being less diverse, more intensively managed and with more gaps present.

3.49 Cereal field margins are an Essex Biodiversity Action Plan habitat and Arable Field Margins are a UK Biodiversity Action Plan habitat.

3.50 The arable and improved grassland on site were assessed as having limited intrinsic ecological value as the plant communities present indicate that nutrient enrichment has reduced floral diversity.

3.51 Ponds are a UK Biodiversity Action Plan habitat. Both the pond on site and the pond to the east of Area F will be retained.

Species

3.52 Based on the results of the phase 1 habitat and ecological scoping survey, the following surveys were recommended and are reported in the following sections:

- Botany survey
- Invertebrate survey
- Great Crested Newt survey
- Reptile survey
- Breeding birds survey
- Water Vole survey

3.53 Appendix A outlines the relevant protected species legislation on site.

3.54 Surveys for wintering birds were not undertaken as the permanent habitat loss of the proposed development is small and there is ample habitat in the wider area which could accommodate wintering waders and wildfowl.

3.55 It is possible that the proposed development would require construction on the foreshore. This could have an impact on birds associated with the SPA and Ramsar site. If necessary, this will be reported separately.

3.56 Surveys for Otters were not undertaken as no Otters are recorded within 2km of the site boundary and the loss of any ditches on site is not considered to have a detrimental impact on foraging Otters.

3.57 The ecological scoping survey did not record any buildings or trees with bat roost potential on site. As such, surveys for roosting bats are not considered necessary and impacts on bats are limited to disturbance effects on commuting and foraging bats.

3.58 Bats are known to be present in the surrounding area, but the proposed development is not expected to lead to the removal of any hedgerows and trees lines that would impede bats' use of the site.

4 BOTANICAL SURVEY

4.1 A more detailed botanical survey of grassland on site was undertaken in order to inform the habitat creation, so that an appropriate mix of locally occurring species could be included within the species lists for grassland creation (see Section 11).

Methods

4.2 An appropriately experienced botanist visited the site on 15th June 2018. The intention was to collect data on plant species within the semi-improved grassland on Zone A. However, the field had been mown just before the date of the survey, and the cropped plant material was still lying on site, which meant that a full survey could not be undertaken.

4.3 Therefore, survey data was collected from an adjacent field in Zone C, which also comprised semi-neutral grassland.

4.4 A walkover survey was undertaken, comprising a walk across the grassland where all species seen were recorded together with an estimate of abundance using the based on the DAFOR scale:

- D: Dominant (75% cover)
- A: Abundant (51% – 75% cover)
- F: Frequent (26% - 50% cover)
- O: Occasional (11% - 25% cover)
- R: Rare (1% - 10% cover)

4.5 In addition, six 2 m x 2 m quadrats were sampled from the grassland. In each quadrat, all plant species present were recorded along with their percentage cover which is then used to determine the abundance of each species based on the DOMIN scale (Table 4.1).

Table 4.1. DOMIN abundance scale for NVC analysis

Cover (%)	DOMIN scale
91-100	10
76-90	9
51-75	8
34-50	7
26-33	6
11-25	5
4-10	4
< 4 (many individuals)	3
< 4 (several individuals)	2
< 4 (few individuals)	1

4.6 The quadrat data was used to determine the National Vegetation Classification (NVC) community of the grassland (Rodwell, 1991 *et seq*) using the computer programme MATCH.

Results

4.7 The species lists from the walkover survey and the NVC quadrat recording are provided in Appendix C.

4.8 No particularly rare or scarce plant species were identified. Analysis of the quadrat data found that the plant communities present were a mixture of two NVC communities:

- MG1b (*Arrenatherum elatius grassland*, *Urtica dioca* sub-community); and
- OV24b (*Urtica dioca-Gallium aparine* community*, Arrenatherum elatius-Rubus fruiticosus* agg. sub-community).

Evaluation

4.9 MG1 grassland is a mesotrophic grassland community characteristic of semi-improved neutral soils. It is a very widespread community throughout the British lowlands of England, Wales and southern and eastern Scotland.

4.10 OV24 is a tall herb open habitat characteristic of more elevated nutrient levels, and which occurs widely throughout lowland Britain.

4.11 Neither community is of intrinsic conservation significance that requires mitigation for habitat loss. However, the species present will be used to inform habitat creation that will be undertaken to provide replacement habitat for the various species groups that would be affected by the loss of grassland. Further details are provided in Section 11.

5 INVERTEBRATE SCOPING SURVEY

Introduction

5.1 An invertebrate scoping survey was undertaken to appraise the invertebrate habitats present on the Main Site (Area A) and to assess whether the proposed development would have an impact on invertebrate ecology. Of particular concern was the potential for the site to support Species of Principal Importance in England, as defined within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, although species included in other conservation categories were also considered.

Methods

5.2 The survey comprised a walkover of Area A and the part of Area C to the north, conducted by two appropriately experienced invertebrate ecologists from Colin Plant Associates. The survey was conducted on 1st May 2018 in cool but bright conditions. All areas of the site were accessible and were examined.

Results

Area A

5.3 Area A (c.18 ha) can be split into two main parts for the purpose of categorising the habitats currently present, which are related to the land use history of the area as a whole.

5.4 The northern section (c.6.5 ha) is a field under arable cultivation, currently a crop of oilseed rape. The expected invertebrate assemblage here is likely to be extremely limited and very unlikely to contain any species of high conservation value.

5.5 The southern section (c. 11.5 ha) is a uniform area of semi-improved grassland bordered by hedgerows and ditches to the north and east. The high fertility of the grassland suggests a history of recent cultivation and examination of Google Earth imagery confirms that this was the case as recently as 2013. The lack of structural variation within the grassland, combined with its low floristic diversity, predicts a species-poor invertebrate assemblage dominated by those with more generalist ecological requirements, which are usually of lower conservation value.

5.6 The hedgerows consist mainly of Hawthorn and a narrow zone of Bramble. Some of the Hawthorns are becoming mature and these provide a large number of potential niches for invertebrates. The ditches are steep-sided and lacking in marginal vegetation with the exception of some Common Reed. They are likely to be subject to considerable fertiliser run-off and to support an impoverished invertebrate fauna.

Area C

5.7 This area is proposed as a potential access corridor for the site under discussion. It currently presents as fields under arable cultivation, again oilseed rape, with an access track along the northern boundary. The expected invertebrate assemblage here is likely to be extremely limited and very unlikely to contain any species of high conservation value.

Evaluation

5.8 No site is completely lacking in value to invertebrates. All green areas make some contribution to the wider ecological interest of the landscape for invertebrates, even if it is simply the maintenance of an open aspect. However, it considered that Area A does not have an intrinsic invertebrate interest that is likely to be raised significantly above the expected regional background level. No further survey work is therefore recommended.

5.9 However, given the Main Site's direct proximity to several areas that are known to support nationally important invertebrate assemblages (Telfer, 2017), it is considered that the Site makes some contribution to the invertebrate ecology of the wider landscape. Numerous rare and threatened species of aculeate Hymenoptera (bees and wasps) are known to nest in the Tilbury area and many of these require extensive grasslands in which to forage, in particular the Shrill Carder Bee *Bombus sylvarum* and Brown-banded Carder Bee *Bombus humilis*, both of which are Section 41 species. The availability of suitable forage (nectar and pollen) sources throughout the whole season from May to September is crucial for populations of these species, which appear to operate at a landscape scale and their survival in the East Thames Corridor in dependent upon the entire remaining network of post-industrial sites and nearby grasslands.

5.10 Although the herbaceous flora of the site is very limited, it does include forage plants utilised by bee species. On this basis, mitigation is recommended (see below).

5.11 Despite the relatively poor condition of the ditches around Area A, ditches in arable land can sometimes support valuable aquatic invertebrate communities. Retention and enhancement of the ditches is therefore recommended.

Mitigation

5.12 In addition to retention and management of hedgerows and ditches around the boundary of Area A wherever feasible, additional habitat creation for invertebrates is recommended.

5.13 This will comprise the creation of a managed compensation area to mitigate for this loss of pollinator habitat in Area A. This will be provided in Area F/G. This should be sown with wildflower seed mixes to provide a continuity of nectar and pollen throughout the flight season. If soil fertility is high, the plant seedmix should include Yellow Rattle to reduce the competitive growth of grasses and maintain a more open and diverse sward.

5.14 Given the presence of a rich aculeate Hymenoptera fauna in the surrounding area, the construction of bee banks will also be undertaken. These can provide useful habitat for many thermophilic ground-nesting invertebrate species including solitary bees, solitary wasps, beetles and spiders and are best created in open, south-facing situations. Compacted soil and gravel should be shaped into a mound with various slopes, hollows and angles that may be utilised and favoured by different species. Vertical or very steep banks often take much longer to vegetate due to the greater heat stress they experience and provide bare ground that could be used for mining/burrowing invertebrate species.

5.15 Further information on habitat creation for mitigation is provided in Section 11.

6 GCN EDNA SURVEY

Introduction

6.1 Cherryfield Ecology undertook an eDNA survey of the large pond in Zone C, west of Zone A and of ditches on the boundary of Zone A in 2017.

6.2 The eDNA test was analysed by Fera, and it returned a negative result for the ditch system and an 'inconclusive' result for the Zone C pond. The 'inconclusive' result was due to degradation of the sample, and hence although no GCN DNA was detected, this is not absolute evidence for determining the absence of the species in the sample provided. However, this pond was also surveyed in 2017 as part of the 'Tilbury 2' development project ecological baseline assessment, and as reported in the Environmental Statement for that development, a negative result was returned from the pond.

6.3 The Zone C pond was created in 2011 as a mitigation and compensation area which was intended to provide advance compensatory habitat for water voles and reptiles that would have needed to be translocated from the Tilbury Centre LoWS had a biomass power generation project for that site been pursued. When RPS commenced surveys in 2018, it was apparent that the Zone C pond has been surrounded by exclusion fencing suitable for exclusion of Water Voles and / or reptiles.

6.4 Given the negative result obtained for the Zone C pond, no further eDNA samples were taken in 2018. However, RPS did undertake eDNA surveys of a small pond located north of the railway line on the extreme eastern tip of Zone F, and additional samples were also taken from the ditch network around Zone A.

Methods

6.5 Environmental DNA (eDNA) sampling is used to assess the presence or absence of GCN DNA from a water sample. This new survey methodology is approved by Natural England as providing evidence of presence / absence of GCN (Biggs *et al*., 2014). Natural England has issued their standing advice, which includes the recommended protocol for eDNA analysis (Gov.UK, 2015). This requires water samples for eDNA to be taken between the 15th of April and the 30th of June.

6.6 The sampling was completed using a sample kit from the laboratory Surescreen Scientifics Limited who subsequently completed the laboratory analysis.

6.7 Water samples were taken from the Zone F pond on the 27th of June and sent to the Surescreen Scientifics Limited Laboratory in Morley, Derbyshire the following day. Lead ecologists were registered to hold a Natural England Great Crested Newt survey Class 1 licence, and had appropriate training for eDNA sampling surveys.

6.8 Field surveys followed a strict protocol to prevent contamination of the samples; this entailed:

- Gloves were worn at all times during the sampling process, and gloves were replaced between sample collection from the waterbody and pipetting into the sterile sub-sample tubes.

- Samples were collected without entering the water, i.e. the surveyor stood only on the waterbody bank or muddy waterbody edges. This prevented disturbance of the substrate to limit cross-contamination.

6.9 The field sampling protocol consisted of the following steps:

- 20 samples were taken from each pond. The location of sub-samples was spaced as evenly as possible around the pond margin. Subsamples generally targeted areas with potential egg laying substrate (e.g. vegetation) and open water areas which newts may be using for displaying. Prior to sampling the water column was mixed by gently using a ladle to stir through the entire water column, whilst avoiding disturbing the sediment on the bed of the waterbody. Sampling of very shallow water was avoided where possible (less than 5-10 cm deep).
- A new pair of gloves were put on to keep the next stage as uncontaminated as possible.
- Using a clear plastic pipette c15mL of water was taken from the bag and pipetted into a sterile tube containing 35mL of ethanol to preserve the eDNA sample (i.e. the tube was filled to the 50 mL mark).
- The tube was shaken vigorously for 10 seconds to mix the sample and preservative. This is essential to prevent DNA degradation and was also repeated for each of the six conical tubes. Before taking each sample, the water in the bag was shaken to homogenise the sample, as DNA material constantly sinks to the bottom.
- The box of preserved sub-samples was kept in a fridge between 0-4^{o}C, and then returned at ambient temperature for analysis.

Results and evaluation

6.10 The Zone E pond returned a negative result for GCN.

6.11 The Zone A ditches returned an ‘inconclusive’ result due to sample degradation, but given that a negative result was obtained for these ditches in 2017 it is considered appropriate to conclude that GCN are absent.

6.12 Furthermore, none of the nine waterbodies surveyed for the Tilbury 2 project were found to contain GCN. It is considered, based on these results, that GCN are not present on the Application Site and do not therefore present a constraint to development.

7 REPTILE SURVEY

Methods

7.1 Artificial refugia in the form of sheets of roofing felt and reptile tins, approximately 0.5 m^2 in size, were placed in likely basking spots (for example, un-shaded patches next to cover, in areas of long grass and next to potential hibernation sites such as piles of rubble, logs or disused rabbit burrows).

7.2 A total of 209 sheets were set out on site on the 18th of April, in the locations shown on Figure 7.1.

7.3 The site was visited on 7 days in May and June 2018 during suitable weather conditions. Reptile activity is greatly influenced by weather conditions, with reptiles most likely to use refugia in temperatures of between 10ºC and 18ºC (Froglife, 1999), in hazy or intermittent sunshine with light winds (Gent & Gibson, 1998).

7.4 The weather conditions and temperatures for each visit are set out in Table 7.1 below.

Table 7.1. Reptile survey dates and weather conditions

Visit Number	Date	Temperature ˚C	Cloud Cover	Wind
1	17/05/18	12-16	4/8	Gentle breeze
2	20/05/18	12-16	4/8	Gentle breeze
3	22/05/18	13-17	4/8	Gentle breeze
4	25/05/18	14-17	8/8	Light breeze
5	01/06/18	16-18	4/8	Light breeze
6	04/06/18	16-17	8/8	Gentle breeze
7	07/06/18	14-17	8/8	Gentle breeze

7.5 Each visit involved walking slowly around the entire site, checking suitable reptile basking and refuge areas and checking all of the reptile sheets on site.

Results

7.6 The location of the reptile sheets is shown in Figure 7.1. Reptile sightings (combined totals of juveniles and adults) on each survey visits are presented in Table 7.2 and the maximum counts for each species per zone are presented in Table 7.3. Results split into separate tables for adults and juveniles are provided in Appendix D.

7.7 Across the whole survey area, a peak count of eight Adders was recorded on the first (17/5) and fifth visit (1/6). A peak count of four Grass Snakes was recorded on the first visit (17/5). A peak count of seven Common Lizards was recorded on the third visit (22/5) and a peak count of 55 Slow-worms was recorded on the fifth visit (1/6).

7.8 Slow-worm and Adder were recorded on all seven survey visits. Grass Snake was recorded on six out of seven visits and Common Lizard was recorded on five out of seven visits.

Table 7.2. Reptile survey results

Visit	Reptile counts																											
	Zone A				Zone C				Zone F				Zone G				Zone I				Zone J				Whole site			
	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C
1	7		7			1								1	1				1		1	2	3		8	4	12	
2	3		18	1	1		2	1						1						2			4		4	1	24	4
3	6	1	10	1								1			1					1	1		3	2	7	1	14	5
4	5	1	18	2			4				5				7				4	5			4		5	1	42	7
5	7	1	27	2		1	5	2		1	4				9				1		1		9		8	3	55	4
6	4	2	24		2	1	8				2				1				4				6		6	3	45	
7	2		6	4	1		5				1				6				1				5		3		25	4

A: Adder

G: Grass Snake

S: Slow-worm

C: Common Lizard

Table 7.3. Maximum reptile counts by Zone.

Species	Maximum count													
	Whole site		Zone A		Zone C		Zone F		Zone G		Zone I		Zone J	
	Max. count	Visit no.[1]	Max. count	Visit no.	Max. count	Visit no.	Max. count	Visit no.	Max. count	Visit no.	Max. count	Visit no.	Max. count	Visit no.
Adder	8	1, 5	7	1, 5	2	6							1	1, 3, 5
Grass Snake	4	1	2	6	1	1, 5, 6	1	5	1	1, 2			2	1
Slow-worm	55	5	27	5	8	7	5	4	9	5	4	4, 6	9	5
Common Lizard	7	4	4	7	2	5	1	3			5	4	2	3

[1]: Visit number is the survey visit when the maximum count was recorded

7.9 Zones A, C, and J, south of the railway line, all supported an assemblage of four species (Adder, Common Lizard, Grass Snake and Slow-worm). Zone F and G north of the railway line had an assemblage of Grass Snake and Slow-worm, and Zone I had an assemblage of Common Lizard and Slow-worm.

7.10 Zone A had the highest maximum counts of all four species (Table 7.3) although Zone J also had the same maximum count for Grass Snake.

Evaluation

7.11 In terms of evaluating the status of reptile populations on site, this has been looked at for areas that will be directly affected by construction.

7.12 Some reptile habitat would be affected by access road construction in Zone C. This area is predominantly arable land of no value to reptiles, but reptiles were recorded in vegetation associated with two ditches that cross the field. Adders and Common Lizards were recorded in these locations.

7.13 The Main Site is located on Zone A, and while it is intended to retain ditches and hedges on the site boundary, the ditch and associated vegetation on the north boundary of Walton Common runs through the centre of Zone A and would be lost, along with the majority of the existing grassland.

7.14 Whether the main portion of the grassland is utilised by reptiles is uncertain; sheets were not put out in the centre of the field because the field is managed by mowing, and was cut towards the end of the survey period. Placing sheets in the main grassland would therefore have risked increasing reptile mortality from the mowing operation.

7.15 Given the management of the grassland and its relatively homogenous nature, it is considered that the field itself probably does not support large numbers of reptiles but they are likely to use it. The main areas where reptiles are likely to be concentrated in Zone A is therefore the unmown grassland, ditch and hedgerow margins around the Walton Common grassland.

7.16 A total of 80 refugia were laid out in this area. If one treats the whole of Walton Common (11.2 ha) as suitable reptile habitat, this gives a refugia density of 7.14 / ha. Froglife (1999) provides guidelines for assessing reptile population sizes based on the numbers of adult sightings on a single visit for refugia at a density of up to 10 sheets / ha.

7.17 Applying these criteria for the adult reptile maximum counts for Zone A gives:

- Adder: 4 adults – ‘low’ population (<5)
- Grass Snake: 1 adult – ‘low’ population (<5)
- Slow-worm: 13 adults – ‘good’ population (5-20)
- Common Lizard: 4 adults – ‘low’ population (<5)

7.18 Another method of assessing reptile population size is provided in HGBI, which assesses populations as High, Medium or Low based on density of adults. However, applying these

criteria to the whole of the grassland area of Zone A would probably result in an underestimate of density given that no sheets were placed in the main grassland area.

7.19 Zone A, with populations of four species one of which is 'good' and two of which are only just below the threshold for 'good' according to the Froglife criteria, is therefore considered to be of high value for reptiles. Given that the majority of the grassland and a stretch of ditch habitat will be lost, mitigation will be required. This is outlined below and in Section 11.

Mitigation requirements

7.20 Given the high numbers of reptiles recorded in Zone A and the presence of reptiles along ditches in Zone C that would be affected by construction, a habitat creation and translocation mitigation plan is proposed.

7.21 Zone F, which is currently an arable field of no value to reptiles, is proposed as the location for creation of replacement reptile habitat. The survey found presence of reptiles on the margins of Zone F and on the adjacent Zone I.

7.22 Creation of reptile habitat on Zone F would provide a like-for-like replacement of habitat on an area basis. However, given the homogeneity of the existing grassland in Zone A, it is considered that with appropriate design the habitat created on Zone F will be capable of supporting a higher density of reptiles than is currently present on Zone A. In addition, the creation of grassland adjacent to Zone I will result in a large single area of reptile habitat that should provide additional robustness for the reptile populations.

7.23 Habitat creation would need to be carried out prior to the translocation to allow the habitats to mature sufficiently to support reptile prey and hence reptiles. It is recommended that at least one full growing season should elapse between seeding new habitat and the release of reptiles onto it.

7.24 More details on proposed habitat creation is provided in Section 11, but in summary would comprise:

- Scraping off agricultural topsoil over the majority of the field to provide a low-nutrient substrate suitable for seeding.
- Wildflower meadow creation using an appropriate native species seedmix.
- Scrub planting.
- Construction of features to maximise habitat diversity, including hummocks / hollows, steep earth banks and a pond.
- Construction of features to provide shelter, basking sites and hibernation sites for reptiles, including a purpose-built Adder hibernacula, rubble mounds and log piles.

7.25 Translocation of reptiles would be undertaken prior to construction. The construction site in Zone A and affected parts of Zone C would be fenced for the duration of construction to prevent reptiles from adjacent area C from entering. Internal drift fencing will be installed to divide Zone A into cells that will increase chances of capture. Reptile mats will be placed in the cells and checked regularly with all captured reptiles relocated to the receptor site.

7.26 The trapping effort required to capture all the reptiles is considered likely to be between 60-90 suitable days. If necessary, trapping in each cell will continue past a minimum of 60 days until five trapping days with no reptile captures have been completed. Trapping would be carried out between April and October.

8 BREEDING BIRD SURVEY

Methods

8.1 The breeding bird survey undertaken was based on a standard territory mapping methodology as outlined in Gilbert *et al*. (1998) and Bibby *et al*. (2000).

8.2 This method is based on the principle that many species during the breeding season are territorial. This is found particularly amongst passerines, where territories are often marked by conspicuous song, display and periodic disputes with neighbouring individuals.

8.3 All bird species were recorded and mapped across the whole site.

8.4 The survey area was walked at a slow pace in order to locate and identify all individual birds. Visits were undertaken early in the morning, finishing before midday. The whole survey area was covered in each visit, using suitable optical equipment to observe bird behaviour and all areas of the site were approached to within 50-100m, where possible. Survey routes were mapped and the direction walked alternated on each visit, to ensure that all areas were covered at various times of day across the duration of the survey. All species encountered within the survey area were recorded and mapped.

8.5 Surveys for breeding birds were undertaken between April and June 2018 with a total of five survey visits taking place. The survey visits and ornithologists undertaking the survey were as follows:

- Visit 1: 12th & 13th April 2018; Matthew White
- Visit 2: 26th & 27th April 2018; Matthew White
- Visit 3: 10th & 11th May 2018; Matthew White
- Visit 4: 22nd & 23rd May 2018; Matthew White
- Visit 5: 6th & 7th June 2018; Matthew White

8.6 On each visit, registrations were recorded directly into ESRI Arcpad GIS software loaded onto handheld PDA devices, with a 1:10,000 scale Ordnance Survey base map of the study area (and adjacent land). A fresh map was used for each survey. Registrations of birds were recorded using standard British Trust for Ornithology (BTO) two letter species codes (BTO 2009). Specific codes were also used to denote singing, calling, movement between areas, flight, carrying food, nest building, aggressive encounters and other behaviour.

8.7 The expected outcome is that mapped registrations fall into clusters, approximately coinciding with territories. A cluster is generally a spatially distinct group of registrations that represent the activity of not more than one pair. Ideally, clusters include registrations of territorial behaviour across all visits and are clearly demarcated from adjacent clusters by simultaneous recording of neighbouring birds. Where a species exhibits high territory density, the mapping of simultaneously singing birds becomes essential. Territory boundaries are assumed to be between such birds.

8.8 Territory mapping methods produce analysis maps of non-overlapping ellipses encircling clusters of records thought to relate to separate pairs of breeding birds. These ellipses may not show the entire extent of the pairs' actual breeding territory which may be significantly larger; however, they are likely to show those areas in which the pair is most active.

8.9 On completion of the surveys, analysis maps were produced for each species, consisting of all registrations recorded during the survey. From these species maps, the number of territories was calculated by identifying the number of territories or clusters present.

8.10 Standard registration mapping techniques were also used to record non-breeding species.

8.11 The following definitions have been used to identify the breeding status of the species recorded:

- Confirmed Breeding: includes species for which territories were positively identified as a result of the number of registrations, the location of an active nest, and the presence of recently fledged young or downy young.
- Probable Breeding: includes a pair observed in suitable nesting habitat in breeding season, or agitated behaviour / anxiety calls from adults suggesting probable presence of nest or young nearby. Behaviour was observed on insufficient occasions to confirm the presence of a territory.
- Possible Breeding: includes species observed in breeding season in suitable nesting habitats, or singing male present (or breeding calls heard) in breeding season in suitable breeding habitat.
- Non Breeding: fly-over species observed but suspected to be on migration, or species observed but suspected to be summering non-breeder.

Assessment criteria

8.12 The assessment of the breeding bird community at Tilbury includes a focus on species that are afforded special statutory protection or those included on one, or more, of the lists of species of conservation interest. These include:

- species listed on Annex 1 of the EC Birds Directive (Directive 2009/147/EC) or species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- species included in the Birds of Conservation Concern (BoCC) Red and Amber Lists (Eaton et al 2015), and priority species within the UK Biodiversity Action Plan (UKBAP) (Anon, 2008) or Essex Local BAP species (EBAP, 2011); and
- those occurring in nationally, regionally or locally important numbers.

8.13 Annex 1 species are those for which the UK Government are required to take special measures, including the designation of Special Protection Areas, to ensure the survival and reproduction of these species throughout their area of distribution.

8.14 The NERC list of Species of Principal Importance is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the Natural Environment and Rural Communities Act 2006; under section 40 every public

authority (e.g. a local authority or local planning authority) must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. In addition, with regard to those species on the list of Species of Principal Importance prepared under section 41, the Secretary of State must:

"(a) take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or

(b) promote the taking by others of such steps."

8.15 Species listed on the BoCC Red List are those that have declined in numbers by 50% over the last 25 years, those that have shown an historical population decline between 1800 and 1995 and species that are of global conservation concern. The 67 species on the Red List are of the most urgent conservation concern.

8.16 Species listed on the BoCC Amber List, of which there are currently 96, include those that have shown a moderate decline in numbers (25%-49%) over the last 25 years and those with total populations of less than 300 breeding pairs. Also included are those species which represent a significant proportion (greater than 20%) of the European breeding or wintering population, those for which at least 50% of the British population is limited to 10 sites or less, and those of unfavourable conservation status in Europe.

8.17 The remaining species are placed on the Green List, indicating that they are of low conservation priority. These species still receive full protection through the provisions of the Wildlife and Countryside Act 1981, as amended.

8.18 The UKBAP was launched in 1994 and established a framework and criteria for identifying species and habitat types of conservation concern. From this list, action plans for priority species of conservation concern were published, and have subsequently been amended and updated.

8.19 Species listed as priority bird species on the Essex local BAP.

Limitations

8.20 Five two day bird surveys were conducted from early April to June 2018 in optimal weather conditions and breeding season period. It is therefore considered that there are no significant limitations that might affect the quality of the survey results.

Results

8.21 A total of 49 species were recorded during the survey of breeding birds within the Tilbury site area between April and June. Of these species, 28 were confirmed to be breeding and 15 species were considered to be probably / possibly breeding, resulting in a breeding bird assemblage of 43 species. Records relating to the remaining six species were considered to be of non-breeding individuals.

8.22 A summary of the breeding and conservation status of the 43 species recorded during the course of the survey, with the numbers of territories identified (or estimated in the case of

probable and possible records) is provided in Table 8.1. The location of breeding birds, where recorded within the proposed development area has also been included.

Table 8.1. The breeding status of species recorded during the breeding bird survey at Tilbury, April-June 2018

Species	Breeding status	Number of breeding territories in each zone										
		Total	A	B	C	D	E	F	G	I	K	J
Blackbird	Confirmed	36	4		6	5	3	4	3	1	1	9
Blackcap	Confirmed	8				1		3	2			2
Blue Tit	Confirmed	14				2	1	2	5			4
Buzzard	NB											
Carrion Crow	P											
Chiffchaff	Confirmed	4										5
Collared Dove	Probable	4					2					2
Chaffinch	Confirmed	17	1	1	3	2	2	2	2			4
Cuckoo	Confirmed	4	1					1				2
Coot	Confirmed	2										2
Coal Tit	P											
Cetti's Warbler*	Confirmed	5	1									4
Dunnock	Confirmed	20	1		3		2	4	3	1		6
Green Woodpecker	Possible	2						1				1
Goldfinch	Confirmed	12	1		3	1		1	1		1	4
Greenfinch	Confirmed	6	1			1						4
Great Spotted Woodpecker	Possible	1			1							
Great Tit	Confirmed	10	1		1		3	1	1			3
House Martin	NB											
House Sparrow	Confirmed	17			1	4	3		1		3	5
Kestrel	Probable	1			1							
Red Kite	NB											
Linnet	Probable	11	2		1			1	2			5
Long-tailed Tit	Confirmed	8				2		1	2			3
Lesser Whitethroat	Probable	2										2
Mistle Thrush	Probable	1										
Mallard	Confirmed	3	1						1	1		
Magpie	Confirmed	8	1			1		1	2		1	2
Moorhen	Confirmed	2	1								1	
Meadow Pipit	Possible	1							1			
Marsh Harrier	NB											
Pheasant	P											
Pied Wagtail	Possible	1									1	
Robin	Confirmed	22				6	3	6	1			6
Reed Bunting	Confirmed	2	1					1				
Raven	Confirmed	1		1								
Reed Warbler	Confirmed	7	3		1			1	1			1
Skylark	Confirmed	5	1		1				1	1		1
Stock Dove	Possible	1						1				
Starling	Confirmed	4					1	1	2			
Swift	NB											
Swallow	NB											
Song Thrush	Probable	3	1		1				1			

Species	Breeding status	Number of breeding territories in each zone										
		Total	A	B	C	D	E	F	G	I	K	J
Sedge Warbler	Confirmed	10	5		2				1	1		1
Whitethroat	Confirmed	48	9	1	6	1		9	6	3		13
Woodpigeon	Confirmed	11	1		1	1			3			5
Wren	Confirmed	33	2	1	2	5	2	6	4	1		10
Yellowhammer	Probable	5	1		2			1				1
Yellow Wagtail	Confirmed	1					1					

Notes on Table 8.1: NB = Non-breeding; P = present; *Schedule 1

8.23 A total of 28 species were confirmed as breeding within the Tilbury survey area in 2018.

8.24 There were 15 species considered to be probably / possibly breeding within the survey area in 2018. Registrations for these species were not wholly indicative of behaviour that could allow confirmation of breeding on site.

8.25 One confirmed breeding species, Cetti's Warbler, is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), was recorded during the survey. Two other Schedule 1 species, Red Kite and Marsh Harrier, were recorded but confirmed not to be breeding on site.

8.26 Of the 43 species considered to be breeding or possibly breeding on site, 18 had some status as species of conservation concern. Ten species are listed as a priority species in the UK BAP, nine species are listed as Species of Principal Importance under Section 41 of the NERC Act, two species are listed on the Local BAP, nine species are included on the BoCC Red List and six species are included on the BoCC Amber List. These species and their relevant statutory protection or list of conservation importance are shown in Table 8.2.

Table 8.2 Conservation status of confirmed breeding species recorded during the breeding bird survey at Tilbury, April-June 2018

Species	Conservation Status				
	UK BAP priority species	Species of Principal Importance	LBAP	Birds of Conservation Concern	Wildlife and Countryside act Schedule 1
Cuckoo	•	•		Red	
Cetti's Warbler					•
Dunnock	•	•		Amber	
House Martin				Amber	
House Sparrow	•	•		Red	
Kestrel				Amber	
Linnet	•	•		Red	
Mistle Thrush				Red	
Mallard				Amber	
Meadow Pipit				Amber	
Reed Bunting	•	•		Amber	
Skylark	•	•	•	Red	
STOCK DOVE				Amber	
Starling	•	•		Red	
Swift				Amber	
Song Thrush	•	•	•	Red	

Species	Conservation Status				
	UK BAP priority species	Species of Principal Importance	LBAP	Birds of Conservation Concern	Wildlife and Countryside act Schedule 1
Yellowhammer	•	•		Red	
Yellow wagtail	•	•		Red	

8.27 The locations of territories of species confirmed as breeding on site and listed as Schedule 1, UKBAP, NERC or BoCC Red or Amber List species are shown in Figures 8.1a-e.

Evaluation

Species Accounts

8.28 The following species accounts relate to those species confirmed as breeding within the survey area in 2018 that are listed on Schedule 1 of the Wildlife & Countryside Act 1981, as a NERC Species of Principal Importance, the Birds of Conservation Concern Red List or as a UK BAP Priority Species. Therefore, these species are regarded as being of high conservation importance. Where the data is available, the number of territories recorded during survey is compared to the species regional and national status. National and regional status is derived from the reports of the Rare Breeding Birds Panel (RBBP), where appropriate (Holling *et al*., 2012).

8.29 Any breeding population identified within the survey area is considered to be of national importance if it exceeded 1% of the national population. No breeding population of any species within the survey area approaches the 1% level of the national population.

Specially Protected Species

8.30 Five Cetti's Warbler confirmed territories were recorded on site. Cetti's warbler is fully protected under Schedule 1 of the Wildlife and Countryside Act 1981. The species is also considered to be a locally common and increasing breeding resident (Smith, 2013).

8.31 The survey area is not considered suitable to support a breeding population of any specially protected bird species for which records were sourced as part of the desk top study (RPS, 2018) but which were not recorded during the surveys undertaken between April and June.

Other Species of Conservation Concern

8.32 Ten of the species recorded as breeding or probably breeding within the survey area in 2018 (Cuckoo, Dunnock, House Sparrow, Linnet, Reed Bunting, Skylark, Starling, Song Thrush, Yellowhammer, Yellow Wagtail) are listed as priority species on the UKBAP.

8.33 Nine of the species recorded as breeding or probably breeding within the survey area in 2018 (Dunnock, House Sparrow, Linnet, Reed Bunting, Skylark, Starling, Song Thrush, Yellowhammer, Yellow Wagtail) are listed in Section 41 of the NERC Act 2006 as being of principal importance for the conservation of biodiversity in England.

8.34 Nine of the species recorded as breeding or probably/possibly breeding (Cuckoo, House Sparrow Linnet, Mistle Thrush, Skylark, Starling, Song Thrush, Yellowhammer, Yellow Wagtail) are included on the BoCC Red List.

8.35 Six of the species recorded as breeding or probably/possibly breeding (Dunnock, Kestrel, Mallard, Meadow Pipit, Reed Bunting, Stock Dove) are included on the BoCC Amber List. Reasons for Amber list status are given below:

Breeding assemblage

8.36 The number of species recorded in an area is a simple measure of diversity that can indicate its importance at each season of the year. Fuller (1980) gives the following breeding diversity criteria which are presented in Table 8.2.

Table 8.2. Breeding diversity criteria

National	Regional	County	Local
85+	0-84	50-69	25-49

8.37 Based on Fuller's criteria, the breeding bird assemblage of the survey area in 2018 (43) is of higher local importance. However, it should be noted that Fuller's analysis was developed in the 1970's. Since then species diversity has declined significantly (Eaton *et al*., 2015). As a result, Fuller's thresholds are too high for today's breeding bird populations. It is considered that the breeding bird assemblage across the whole survey area is of district importance.

Outline assessment of potential impacts

Impacts of habitat loss on breeding bird assemblage

8.38 Breeding bird habitat would primarily be lost for the construction of the Main Site in Zone A. A total of 40 breeding territories were recorded in Zone A, and it is likely that some of these will be lost, particularly those associated with the grassland and with the ditch habitat across Zone A that will be removed. It is hoped that species associated with the boundary hedgerows, including one Cetti's Warbler territory, would remain as breeding species although disturbance during construction may affect breeding in the short term.

8.39 Smaller-scale losses of habitat will occur from:

- Widening of the construction access road at pinch points. This will require loss of some habitat adjacent to the road (which may be temporary) but significant losses would not occur.
- Construction of an Access Road for the operational development (Zone C).
- Installation of a Gas Connection Pipeline (Zones C/D/E). Most of this habitat loss will be temporary. There is a small area of permanent habitat loss for some infrastructure in Zone E, around 50 m by 50 m.
- Loss of arable habitat for habitat creation (Zone F). This comprises arable land that will be used as mitigation for loss of Common Land and loss of habitat for protected and other

species, and therefore the overall impact on the breeding bird community in Zone F will be positive.

8.40 The main impact on breeding birds is therefore habitat loss for the Main Site in Zone A. This will remove areas of breeding bird habitat including: semi-improved grassland, scrub, and wet diches with reeds.

8.41 This will impact the breeding and foraging habitat areas of several species of conservation concern including the Schedule 1 listed Cetti's Warbler (1 territory present on Zone A west boundary), red listed (Cuckoo, House Sparrow, Linnet, Skylark, Song Thrush, Yellowhammer And Yellow Wagtail). It is hoped that species associated with the boundary hedgerows, Cetti's Warbler territory, would remain as breeding species although disturbance during construction may affect breeding in the short term.

8.42 As far as possible, boundary ditches and hedges around Zone A will be retained and enhanced. Soft landscaping is also proposed, all of which would reduce the impacts of habitat loss in Zone A.

8.43 However, mitigation for loss of grassland, scrub and ditch habitat is proposed– see below and Section 11.

Other potential impacts

8.44 Other potential impacts on breeding birds are considered to be:

- Noise disturbance during construction / operation
- Lighting disturbance during construction / operation
- Visual disturbance during construction / operation
- Indirect habitat impacts during construction (e.g. dust generation)

8.45 Construction impacts would be minimised by best practice construction methods, to be formally documented in a Construction and Environment Management Plan (CEMP) produced prior to commencement.

8.46 Operational impacts would be minimised by site design including measures to minimise noise and lighting spillage into surrounding areas.

8.47 These impacts will be assessed in more detail for the Environmental Statement.

Outline mitigation measures

8.48 All wild bird nests and their eggs are protected under the Wildlife and Countryside Act 1981. It is therefore a requirement that the development proposals avoid disturbance or harm to any birds breeding on the site. This can most easily be achieved by clearing habitats within the development area with the potential to support nesting birds outside of the breeding season (March – August inclusive).

8.49 Mitigation measures for loss of breeding and foraging habitat will comprise habitat creation in Zone F. Habitat creation will comprise meadow grassland and scrub planting on an existing

area of arable land, hedgerow planting, ditch clearance and restoration and pond creation to provide alternative breeding habitats for the bird species affected, including the Cetti's Warbler.

8.50 These habitat mitigation measures should compensate for any local negative impacts on the breeding and foraging habitat.

8.51 Further details on mitigation are provided in Section 11

Conclusions

8.1 The survey of breeding birds recorded a breeding assemblage of 43 species in 2018. The survey undertaken from April - June 2018 was an optimal peak breeding time.

8.2 Of the 43 species recorded as breeding or probably / possibly breeding within the survey area, 18 species meet at least one of a range of criteria relating to special statutory protection or conservation importance.

8.3 No species considered as breeding or probably / possibly breeding are present in any significant numbers, approaching 1% of the UK population.

8.4 The diversity of species present within the survey area is at a level indicative of district importance to breeding birds.

8.5 The proposed development will mainly remove areas of habitat in Zone A/C including semi-natural grassland, scrub and ditches. This is likely to cause a loss of suitable breeding and foraging habitat.

8.6 Mitigation measures will be put in place to restore and create habitats to the north of the site in Zone F to compensate for breeding bird habitat loss in Zones A/C. This will include semi-natural grassland creation, scrub planting, hedgerow creation and restoration, wet ditch clearance and restoration and pond restoration and creation.

9 WATER VOLES

Methods

9.1 Water Voles typically inhabit slow-moving streams, ditches, dykes and rivers and feed mostly on waterside vegetation. They are active in daylight hours, and leave several indications of their presence, notably burrows, runs, feeding remains and latrines. Particular attention was paid to areas typically used for latrines, and other areas were searched for evidence such as feeding remains, lawns, burrows, runs and footprints.

9.2 The Water Vole survey was undertaken using the methodology as described in Strachan *et al*. (2011).

9.3 The locations of ditches surveyed for Water Voles are shown on Figure 9.1. Surveys were carried out on two occasions, in May and July. On the May visit, 100 m of each ditch was surveyed. On the July visit, where many ditches were found to be dry, the entire length of each surveyed ditch was searched for Water Vole signs.

9.4 Ditches were searched for Water Vole field signs including visual sighting of animals, droppings, burrows, lawns, feeding stations, runs and footprints. Evidence for the presence or absence of Mink, Otter and Brown Rat was also noted if seen. Information on habitats was also recorded including habitat type, bank substrate and profile, bordering land use and vegetation cover.

Results

9.5 Water Voles were recorded in seven of the 11 ditches surveyed in May. They were present in five of the ditches on or adjacent to the Main Site in Zone A, and were also present in two ditches that cross Zone C. Water Voles were absent from ditches adjacent to Zone F.

9.6 In the July survey, ditches north of the railway line were not surveyed. Of the 8 ditches south of the railway line, four were found to be dry with no Water Vole signs observed. Of these, three of the ditches had signs of Water Voles during the May visit. In Zone A, ditch 7 had much higher numbers of Water Vole signs than in the May visit, and ditch 8 also had signs of Water Vole presence in July despite there being no signs in this ditch in May.

9.7 A summary of the results is provided in Table 9.1 and on Figures 9.1 and 9.2. Ditches

Table 9.1. Water vole survey results

Ditch number	Ditch Zone	Visit 1			Visit 2		
		Burrows	Latrines	Feeding remains	Burrows	Latrines	Feeding remains
1	C	2	3	Present	Dry	Dry	Dry
2	A/C	0	1	Present	2	2	Present
3	I	3	8	Present	N/S	N/S	N/S
4	F	0	0	Absent	N/S	N/S	N/S
5	F	0	0	Absent	N/S	N/S	N/S
6	A/C	1	2	Present	1	0	Absent
7	A	2	0	Present	14	8	Present
8	A	0	0	Absent	14	16	Present
9	A	0	0	Absent	Dry	Dry	Dry
10	A	0	2	Absent	Dry	Dry	Dry
11	A/C	0	1	Absent	Dry	Dry	Dry

N/S: Not surveyed

Evaluation

9.8 Water Vole populations have been assessed in accordance with the method set out Dean *et al*. (2016), which uses numbers of latrines recorded per 100m of surveyed ditch to give an indication of relative population size in accordance with the thresholds in Table 9.2. Relative population density for the ditches surveyed in May and July are provided in Table 9.3.

Table 9.2. Criteria for assessing relative Water Vole population size (from Dean *et al*., 2016)

Number of latrines per 100m of ditch		Relative population density
April – mid June	July - September	
> 9	> 19	High
3-9	6-19	Medium
1-2 (or zero if other signs of presence are noted)	1-5 (or zero if other signs of presence are noted)	Low

Table 9.3 Water vole survey results per 100m of ditch surveyed

Ditch number	Ditch Zone	Visit 1		Visit 2	
		Latrines per 100m	Relative population density	Latrines per 100m	Relative population density
1	C	3	Medium	Dry	Dry
2	A/C	1	Low	0.46	Low
3	I	8	Medium	N/S	N/S
4	F	Absent		N/S	N/S
5	F	Absent		N/S	N/S
6	A/C	2	2	0	Low (burrow present)
7	A	0	Low (burrow present)	4.20	Low
8	A	Absent		12.74	Medium
9	A	Absent		Dry	Dry
10	A	2	Low	Dry	Dry
11	A/C	1	Low	Dry	Dry

N/S = not surveyed

9.9 During the May survey, low numbers of Water Voles were found in ditches around and within Zone A, in a ditch west of Zone I and two ditches in Zone C. In July, Water Vole signs had increased considerably in central Zone A ditches 7 and 8, with Ditch 8 now supporting a medium population, and the boundary ditches of Zone A were dry.

9.10 The summer of 2018 has been characterised by exceptionally low rainfall and these results indicate that the central Zone A ditches provide an important refuge habitat for Water Voles during periods when the boundary ditches dry out. Therefore Ditches 7 and 8 are likely to be of importance in ensuring that the Water Vole population in the surrounding area is maintained. Mitigation will therefore need to be considered on this basis.

Outline mitigation strategy

9.11 All works involving loss of Water Vole habitat and capture and translocation of Water Voles will need to be carried out under a licence from Natural England. The licence will be obtained prior to the start of any works affecting Water Vole habitat.

9.12 A detailed mitigation plan would therefore be produced prior to commencement, but the outline mitigation proposals are provided below.

Zone A

9.13 Construction of the flexible generation plant would result in the loss of approximately 500 m of ditch habitat that supports Water Voles. In addition, ditches 7 and 8 appear to act as a refuge for Water Voles during dry periods. A further 1.5 km of boundary ditches around the edges of the development area is expected to be retained.

9.14 It is therefore important to ensure that the revised ditch network post-construction includes ditches which retain water for the same length of time as ditches 7 and 8.

9.15 This could be achieved by deepening retained boundary ditches in Zone A so that they hold water for longer during the summer. This would need to be carefully planned due to the presence of Water Voles in them. A phased programme of works could be undertaken, involving relocation of Water Voles by strimming short lengths of vegetation (no more than 50m at any one time, as per recommendations in Dean *et al.* (2016)) prior to deepening works being undertaken, then allowing vegetation to recover and Water Voles to recolonise before undertaking further work. It is likely that this would be undertaken over a period of at least two years.

9.16 This would provide replacement habitat at times of low water levels but does not address the overall loss of ditch habitat. Additional habitat could be created along the north boundary of the main site and running north-south through the site, potentially also connecting to attenuation ponds. This will be further explored subject to subject to study of space constraints, the hydrology of the site and proposed drainage design, as the ditches would need to be guaranteed a sufficient water supply. Ideally an equal or greater length of new ditch would be created to compensate for losses.

9.17 In addition to the above measures, Water Voles are currently absent from ditches adjacent to Zone F. Together, these ditches comprise c 830 m of habitat. It is therefore recommended that further monitoring of these ditches is undertaken to determine whether Water Vole absence is simply due to a lack of colonisation opportunities, or if there are enhancement measures that could be introduced to improve their suitability.

9.18 These ditches would then be either available for natural colonisation by Water Voles, and could also be used as receptor sites if translocation from ditches in Zone A or Zone C is necessary, providing the nucleus of further expansion of the Water Vole population. Translocations would be undertaken in accordance with the methods set out in Dean *et al.,* (2016), and any new habitats would be given sufficient time to mature and be suitable for Water Voles before any translocations occur.

9.19 Additional ditch creation in Zone F should also be possible subject to a hydrological assessment of feasibility in terms of maintaining appropriate water levels to allow year-round use by Water Voles.

9.20 Taken together, the measures identified above should allow for the existing Water Vole population to be maintained around Zone A, along with additional populations being established in Zone F.

Zone C

9.21 Two ditches containing Water Voles would be crossed by the gas connection pipeline and the operational site Access Road.

9.22 Impacts from the gas connection installation could be avoided by Horizontal Directional Drilling underneath the ditches. Alternatively, Water Voles would need to be relocated from the works area under licence. Given that it is unlikely that more than 50 m of habitat would be affected by this operation, animals would be relocated through strimming, or translocation if >50 m would be affected.

9.23 The Site Access road would be a permanent structure that in addition to habitat loss would also, in the absence of mitigation, result in a severance effect.

9.24 The Site Access road should therefore be designed to include a culvert of suitable width (minimum 1200mm), with mammal ledges, so that Water Voles are able to access habitat on either side of the road.

9.25 Construction of the Access Road would result in habitat loss and therefore relocation of Water Voles under licence would be required in advance of construction, in a similar way to the gas pipeline.

10 BADGERS

Methods

10.1 Signs of Badgers were searched on specific surveys carried out in April 2018 and were also noted by surveyors undertaking other surveys throughout the April – July survey period.

10.2 All field signs were recorded and a detailed assessment was made of any setts, if found, noting the signs of activity levels and current status.

Results

10.3 No active Badger setts were found during the survey that would be directly affected by construction in Zone A.

10.4 Badger signs across the survey area were limited – locations of signs are shown on Figure 10.1.

10.5 A disused single hole outlier active sett was found along the proposed construction access track close to a location where some widening of the road is required to allow construction traffic to access the development site. The sett was considered to be disused because of debris in the sett entrance that remained in place through the duration of the survey period (April – June). No other Badger setts were found.

10.6 A confidential figure showing the location of the sett has been produced and will be made available to people with a legitimate need to know.

Evaluation and summary

10.7 The site as a whole has limited Badger activity, and it is not considered that the construction of the development site would result in significant losses of Badger foraging habitat or other impacts on local Badger populations.

10.8 A disused single hole outlier sett was present in close to a location that would be affected by construction access road widening, and therefore the status of the sett should be monitored until the start of construction. If it is found to be active when road widening works are required, a licence from Natural England would need to be obtained to either disturb or close the set while the widening works take place.

11 OUTLINE ECOLOGICAL MITIGATION MEASURES

Introduction

11.1 This section sets out the proposed habitat creation and mitigation strategy for the site. The survey results presented in Sections 3-10 have identified the following species or species groups where mitigation is required in order to minimise adverse effects from construction or operation of the development.

11.2 These groups are:

- Invertebrates: loss of foraging grassland habitat, particularly for bees
- Reptiles: four species of reptile are present on the Main Site
- Breeding birds: loss of grassland habitat will result in a reduction of territory, and disturbance from construction could reduce breeding densities during the construction phase.
- Water Voles: these are present in ditches within and adjacent to the Main Site. In addition, the access road and gas pipeline will cross two ditches where Water Voles occur.

11.3 The intention of this section is not to provide full details of measures to minimise construction impacts such as dust generation, surface water-run-off, noise etc. These impacts will be assessed as part of the Environmental Statement, and a Code of Construction Practice and Construction and Environment Management Plan will be produced which will detail best practice measures to control dust generation and other potential impact pathways during construction.

11.4 This section provides an outline of the proposed habitat creation in Zone F that will be undertaken to mitigate impacts on species. The mitigation strategy is intended to provide a robust package of habitat creation that will cover all the mitigation requirements for species that are affected. The intention is to ensure that the development provides an overall ecological net gain for species and habitats.

11.5 The layout of the Main Site in Zone A is being designed to retain existing boundary features to the greatest extent feasible, thereby minimising impacts on species associated with these including Water Voles, and additional ditch creation is also being considered here. The following text relates to Zone F habitat creation.

Habitat creation proposals

11.6 An **indicative** proposed habitat creation design is provided in Figure 11.1. This will be subject to detailed revision following consultation, but is intended to provide an indication of how the design can incorporate features suitable for a range of species.

11.7 The existing habitat in Zone F is arable land. It will not therefore be suitable for creation of semi-improved grassland without removal of the top layer of nutrient-enriched arable soils. It is therefore proposed that the top layer of soil is either removed or deep ploughed to reduce

nutrient levels to a level suitable for neutral grassland creation, leaving a thin layer of topsoil over the low-nutrient subsoil. Some of the topsoil could be used to create mounds, bee banks etc, and the remainder would be removed off site.

11.8 Following topsoil stripping, further groundworks would be undertaken to create areas of hummocks / hollows and scrapes. The intention is to provide a varied topography that would result in microhabitats, thereby increasing the range of plant and invertebrate species that would colonise the site.

11.9 Ditch and pond creation would also be undertaken. Appropriate aquatic and marginal plants would be used. Depending on feasibility the existing ditches would be improved so that they are also capable of supporting Water Voles, and this would also create habitat for Cetti's Warbler.

11.10 Scrub and hedgerow planting, comprising native species including berry and seed-bearing species would be carried out, and the remaining substrate would be seeded with a native meadow neutral grassland seedmix. It should also be possible to take a hay crop from the Zone A grassland and use this as part of the seeding plan, thereby providing local provenance seeds to assist colonisation.

11.11 Additional habitat features that will be created are:

- Additional stands of reed: to provide habitat for Cetti's Warbler.
- Bee banks: Compacted soil and gravels shaped into a mound with various steep and shallow slopes, hollows and angles that can be utilised by burrowing invertebrate species, and as basking sites by reptiles.
- Log piles: Native species hardwood logs of varying lengths and sizes, placed in piles of approx. 3 m x 3 m x 1 m size, to provide habitat for invertebrates as well as shelter for reptiles and small mammals.
- Rubble mounds: Part-buried mounds of stone of assorted sizes approx. 3 m x 3 m x 1-1. 5 m. These provide shelter, basking and hibernation sites for reptiles.
- Adder hibernacula. Adders often hibernate communally, and Adder hibernacula in accordance with the design specified in Julian & Hand (2018) would be provided.

11.12 The habitats created above would provide:

- Habitats for a range of invertebrates including aquatic species, burrowing bees and wasps, and flowering plants that would provide food for a large number of species
- A substantial area of reptile habitat, suitable for all four species that would be translocated from the development site
- Nesting and foraging habitat for ground-nesting birds characteristic of open grassland (e.g. Skylark, Meadow Pipit) and farmland species (e.g. Linnet, Yellowhammer), with the scrub providing further diversity for species known to occur on site such as Cetti's Warbler.
- Habitat for Water Voles translocated from the receptor area.

11.13 The habitat creation proposals would also benefit a range of other species such as small mammals including Hedgehog, common amphibian species, Badgers and foraging bats.

Management and monitoring

11.14 Regular ecological monitoring to assess the success of habitat creation measures would be undertaken.

11.15 In order to maintain the habitats in suitable condition, ongoing management would be required.

11.16 The design and management regime of the habitat creation area would be formalised via a detailed Ecological Management Plan (EMP), which would be periodically reviewed and updated as a result of ecological monitoring.

11.17 Management of the site would comprise:

- Grassland mowing and removal of arisings. Mowing would be phased so that not all of the site is cut at any one time. Some areas would be left to develop a more rank tussocky structure, and others would be cut more regularly so that a mosaic of varied structure is created. Mowing would be undertaken with due regard to the presence of reptiles and hence the grassland would not be cut any lower than 15 cm and would be undertaken during suitable weather conditions when reptiles are active and therefore capable of avoiding injury. Some cuttings would be left in designated compost pile areas as these can provide further diversity and potential egg-laying sites for Grass Snake.
- Scrub and hedge management. To encourage development of dense scrub that does not encroach on the grassland. Occasional clearance of some scrub would be carried out on a long rotational basis to encourage a diverse structure. Hedgerow management would aim to create a dense, thick hedgerow.
- Ditch and pond management. Periodic cutting of bankside vegetation and removal of arisings. Only one side of a ditch would be cut at any one time to minimise disturbance of Water Voles.

Summary

11.18 The mitigation strategy outlined above is intended to provide an overall net gain in terms of habitats and hence for species for the construction of the Peaking Plant in Zone A, by providing an equivalent area of more diverse habitats capable of supporting a range of species.

11.19 By creating new wildlife habitat adjacent to existing grassland in Zone I, an overall larger area of habitat will be created than would otherwise be the case, which presents additional benefits in terms of habitat patch size.

11.20 In summary, therefore, the mitigation strategy as outlined above and to be further developed during the DCO application process is considered to provide appropriate mitigation and enhancements to ensure an overall net gain in terms of biodiversity value.

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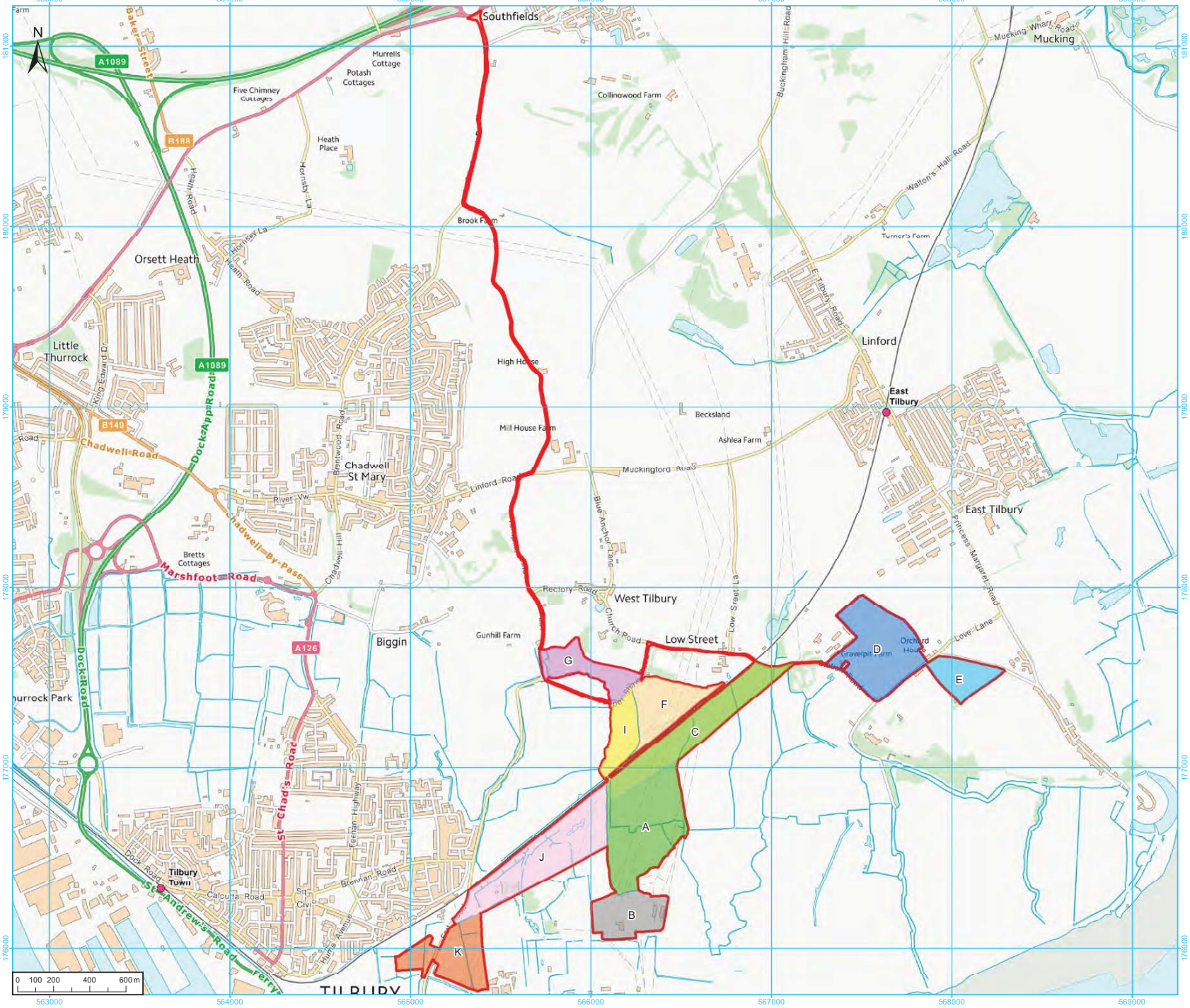
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FIGURES

Figure 1.1. Site location plan



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Legend

Site boundary

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Site boundary, zones, and proposed development

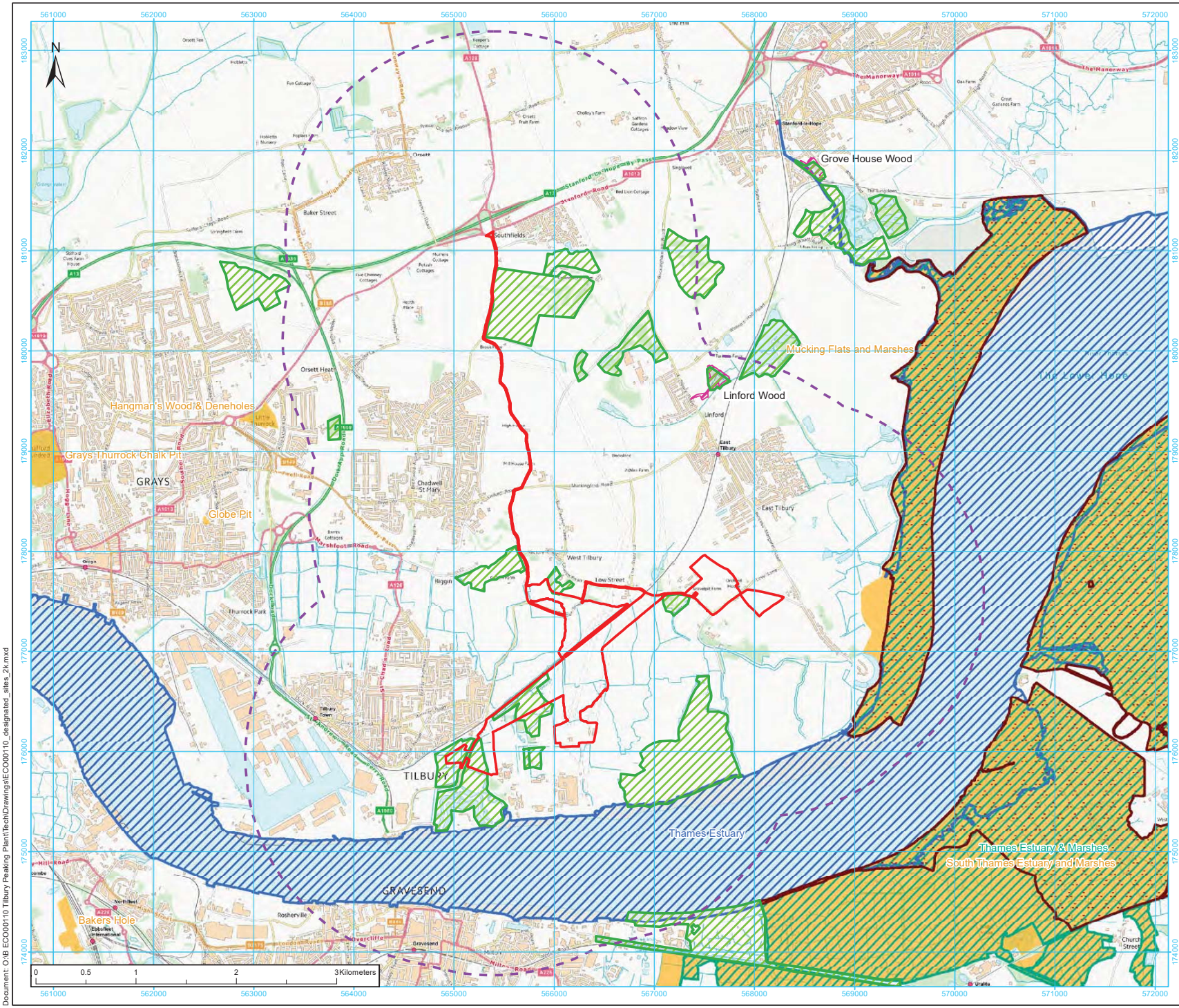
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Drawing Number		**Rev**
Figure 1.1		B

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Document: O:\B ECO00110 Tilbury Peaking Plant\Tech\Drawings\ECO00110_Fig1.1 Site boundary, zones, development.mxd

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Figure 2.1. Designated sites map



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Legend

- Site boundary
- 2km from site boundary
- Site of Special Scientific Interest
- Ramsar Site
- Special Protection Area
- Local Nature Reserve
- Local Wildlife Site
- Recommended Marine Conservation Zone

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Designated sites within 2km of development

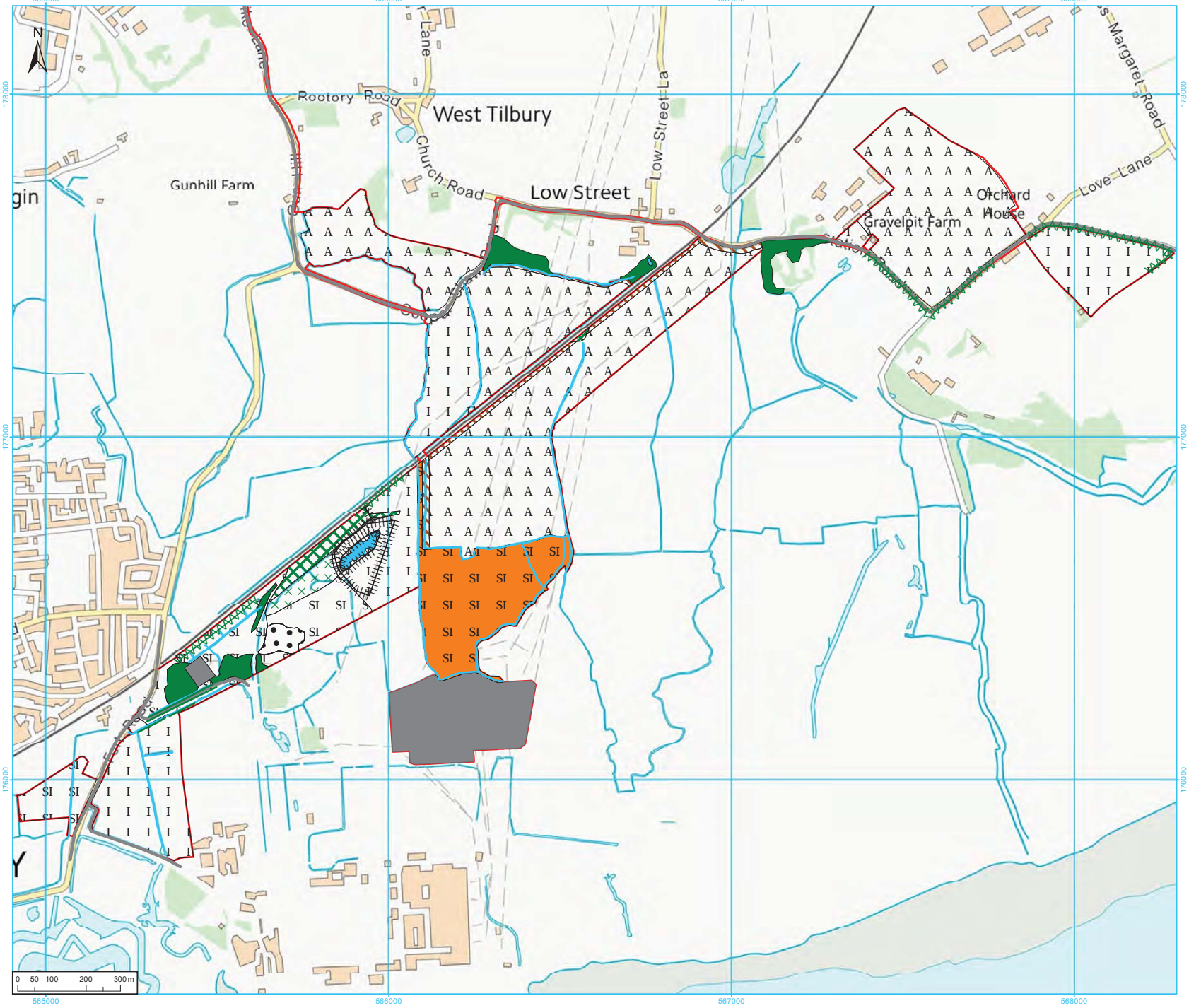
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Final	KM	MF
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Drawing Number		**Rev**
Figure 2.1		A

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Figure 3.1. Phase 1 habitat map



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Legend

- Site boundary
- Semi-natural broadleaved woodland
- Dense scrub
- Scattered scrub
- Semi-improved grassland
- Improved grassland
- Poor semi-improved grassland
- Tall ruderal
- Standing water
- Hard standing
- Arable
- Bare ground
- Standing water (ditch)
- Hard standing (road)
- Native species-rich hedgerow
- Species poor hedgerow
- Fence

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Phase 1 habitat

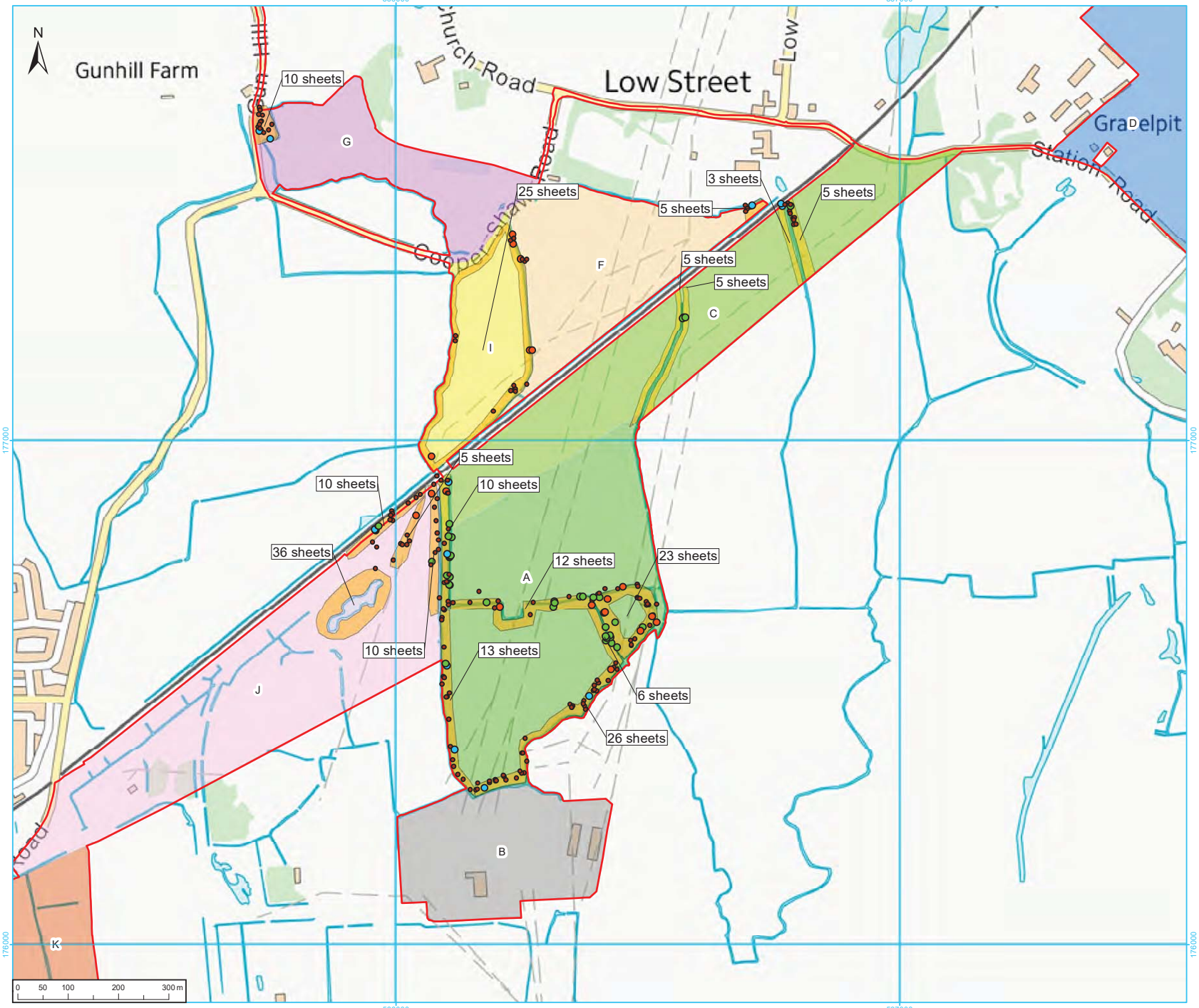
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Final	KM	JK
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Drawing Number		**Rev**
Figure 3.1		B

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Figure 7.1. Reptile survey results



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Legend

- Site boundary
- Areas surveyd for reptiles
- Adder
- Common lizard
- Grass snake
- Slow worm

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Locations of reptles recorded

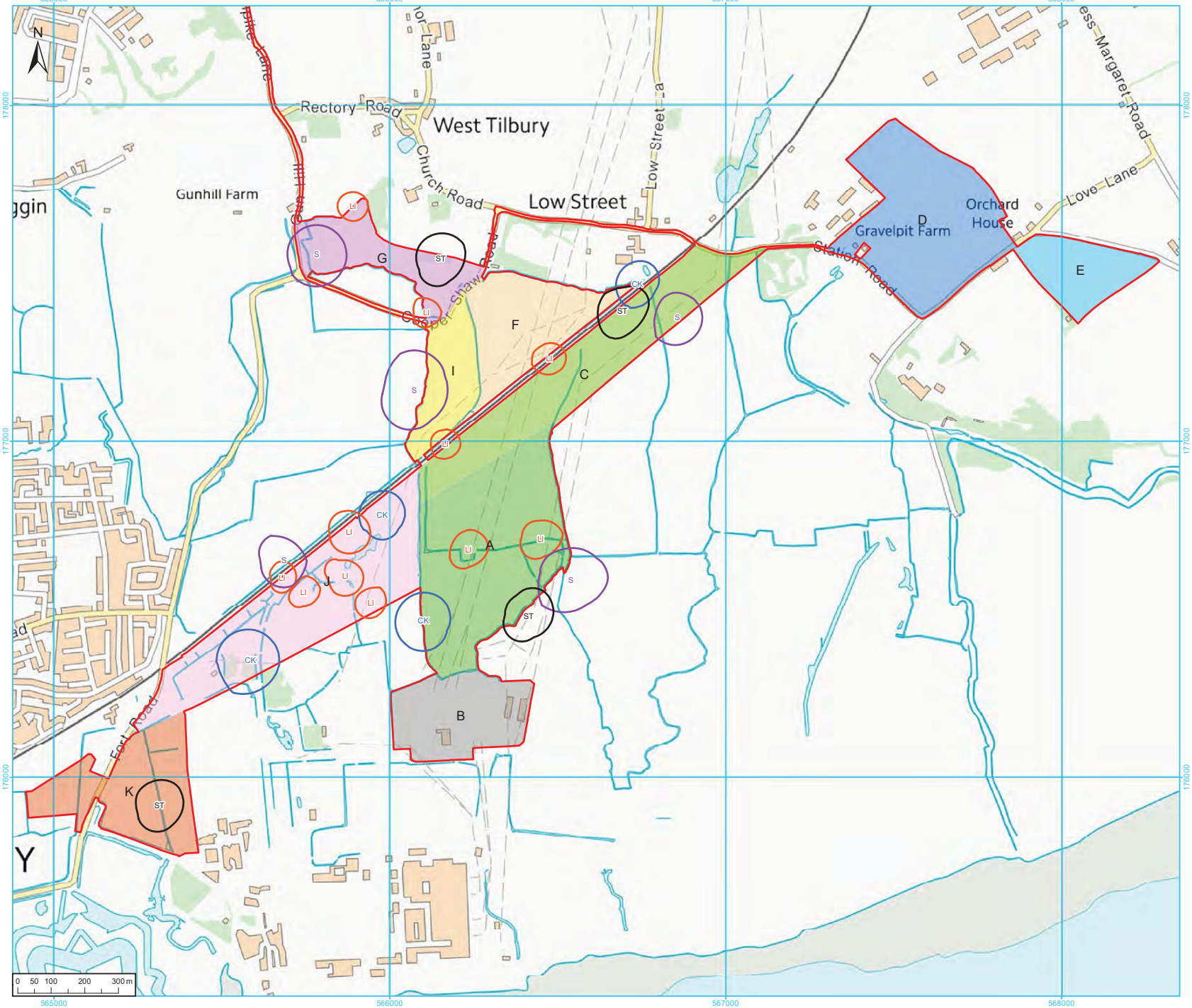
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Drawing Number		**Rev**
Figure 7.1		B

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Figure 8.1a-e. Locations of breeding bird territories for species of conservation interest



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Legend

Site boundary

Breeding bird territories

- Song Thrush
- Skylark
- Linnet
- Cuckoo

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

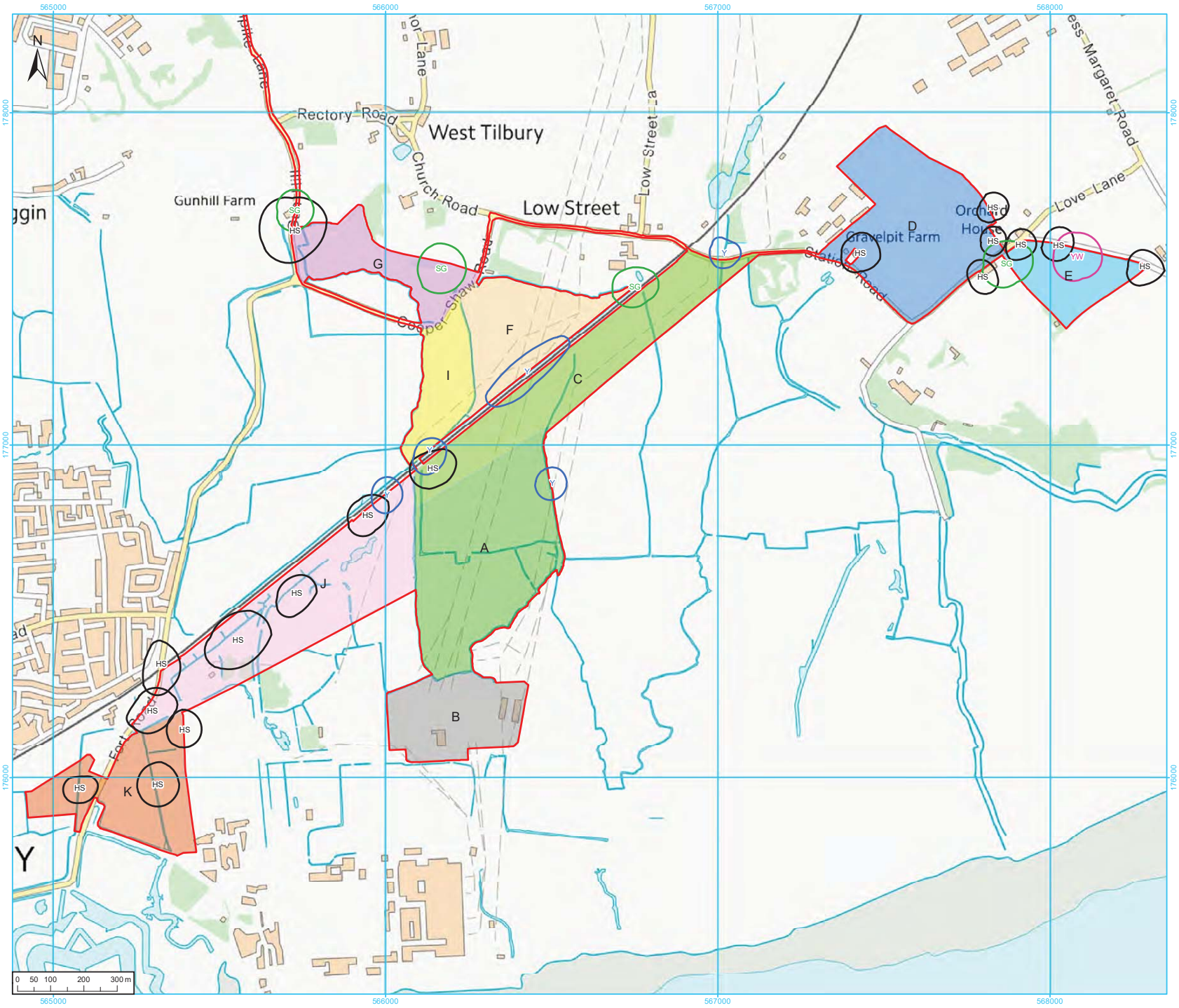
Title: Territories of Red Listed Breeding Birds

Status	Drawn By	PM/Checked By
Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
ECO00110	1:11,280	JUN 18
Drawing Number		**Rev**
Figure 8.1a		A

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Legend

- Site boundary

Breeding bird territories

- Yellow Wagtail
- Yellowhammer
- Starling
- House Sparrow

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

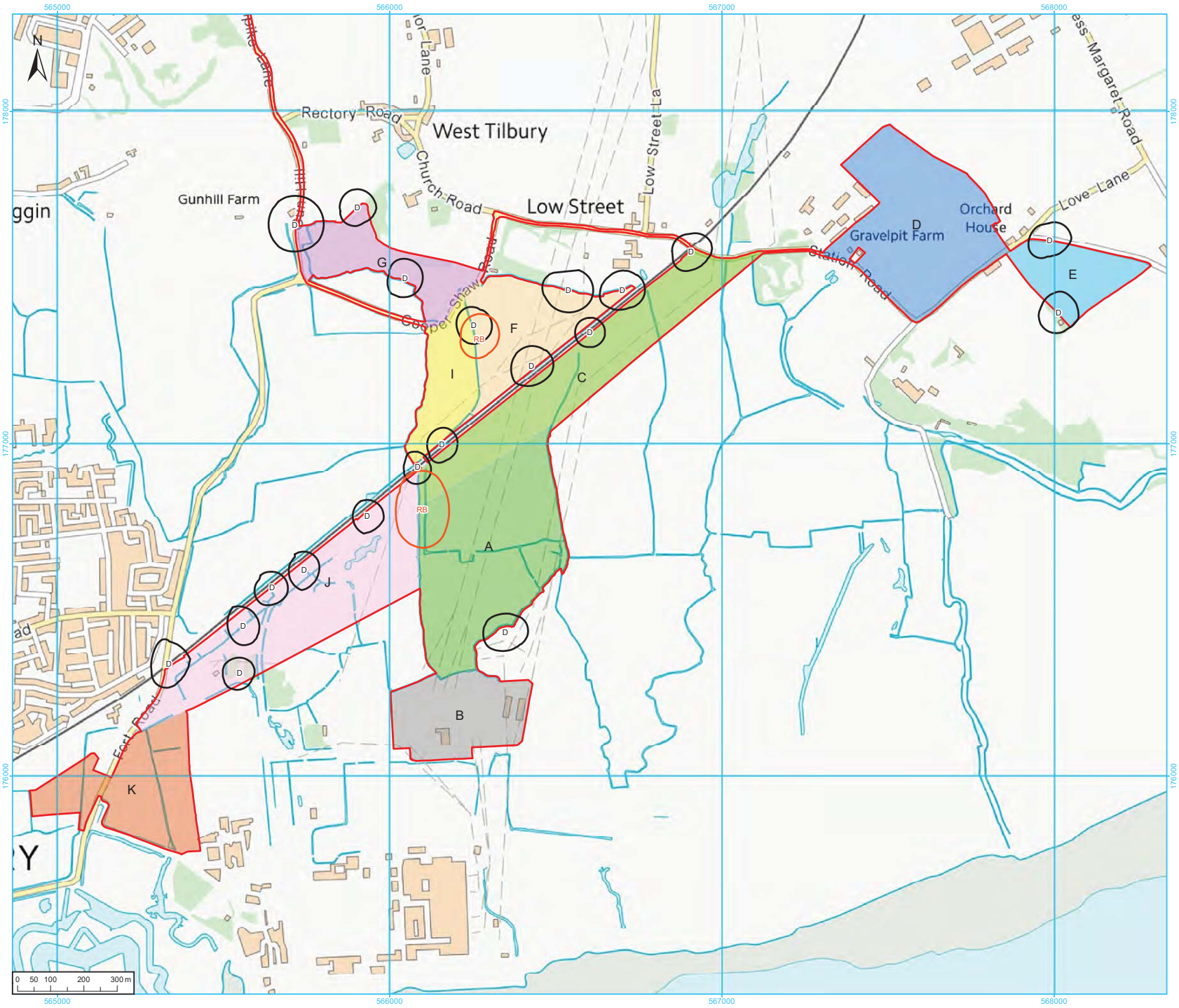
Title: Territories of Red Listed Breeding Birds

Status	Drawn By	PM/Checked By
Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
ECO00110	1:11,280	JUN 18
Drawing Number		**Rev**
Figure 8.1b		A

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Legend

- Site boundary

Breeding bird territories

- Reed Bunting
- Dunnock

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

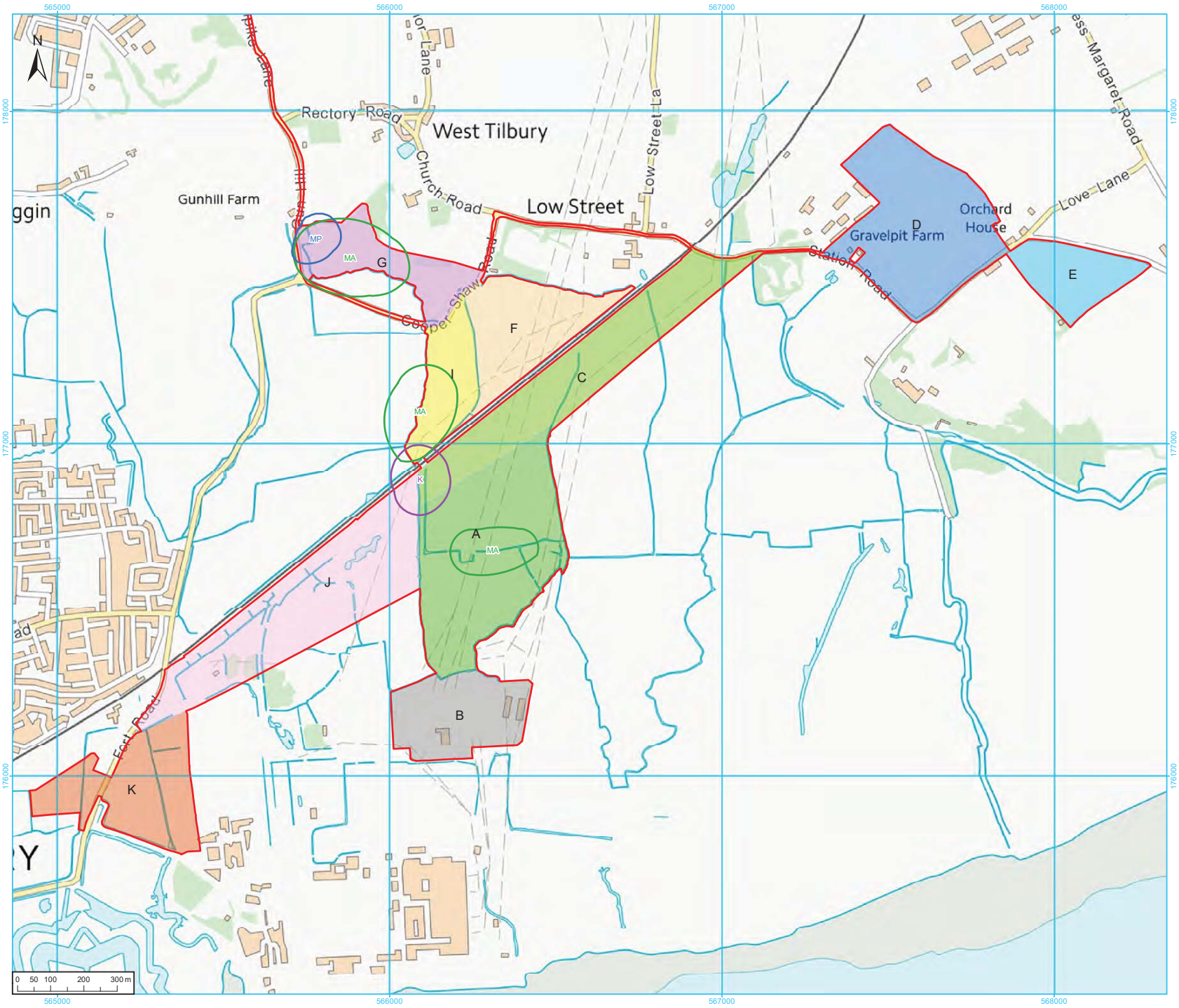
Title: Territories of Amber listed breeding birds

Status	Drawn By	PM/Checked By
Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
ECO00110	1:11,280	JUN 18
Drawing Number		**Rev**
Figure 8.1c		A

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Legend

Site boundary

Breeding bird territories

- Meadow Pipit
- Mallard
- Kestrel

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

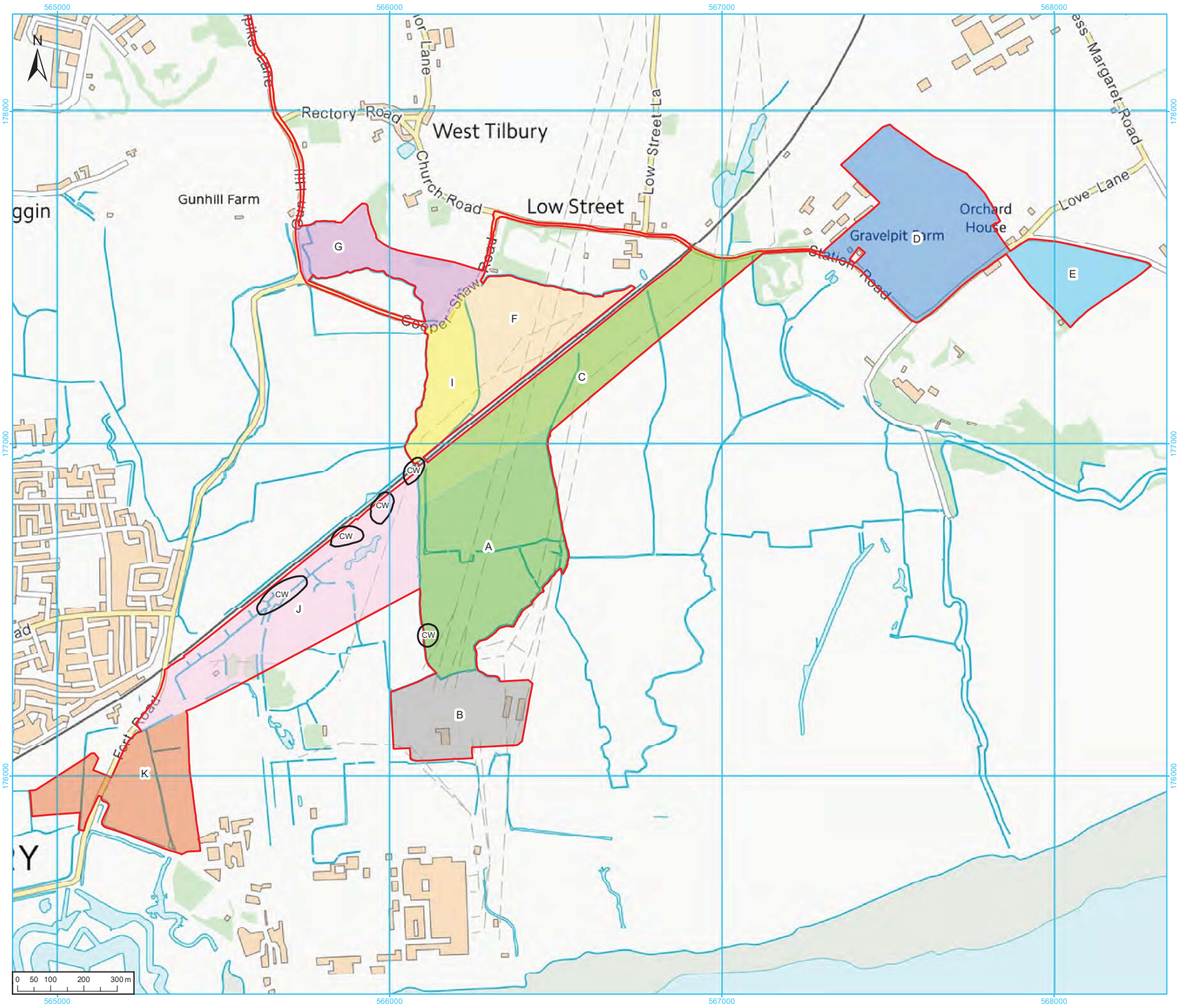
Title: Territories of Amber listed breeding birds

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Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
ECO00110	1:11,280	JUN 18
Drawing Number		**Rev**
Figure 8.1d		A

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Legend

Site boundary

Breeding bird territories

Cetti's Warbler

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Genertion Plant

Title: Territories of Schedule 1 breeding birds

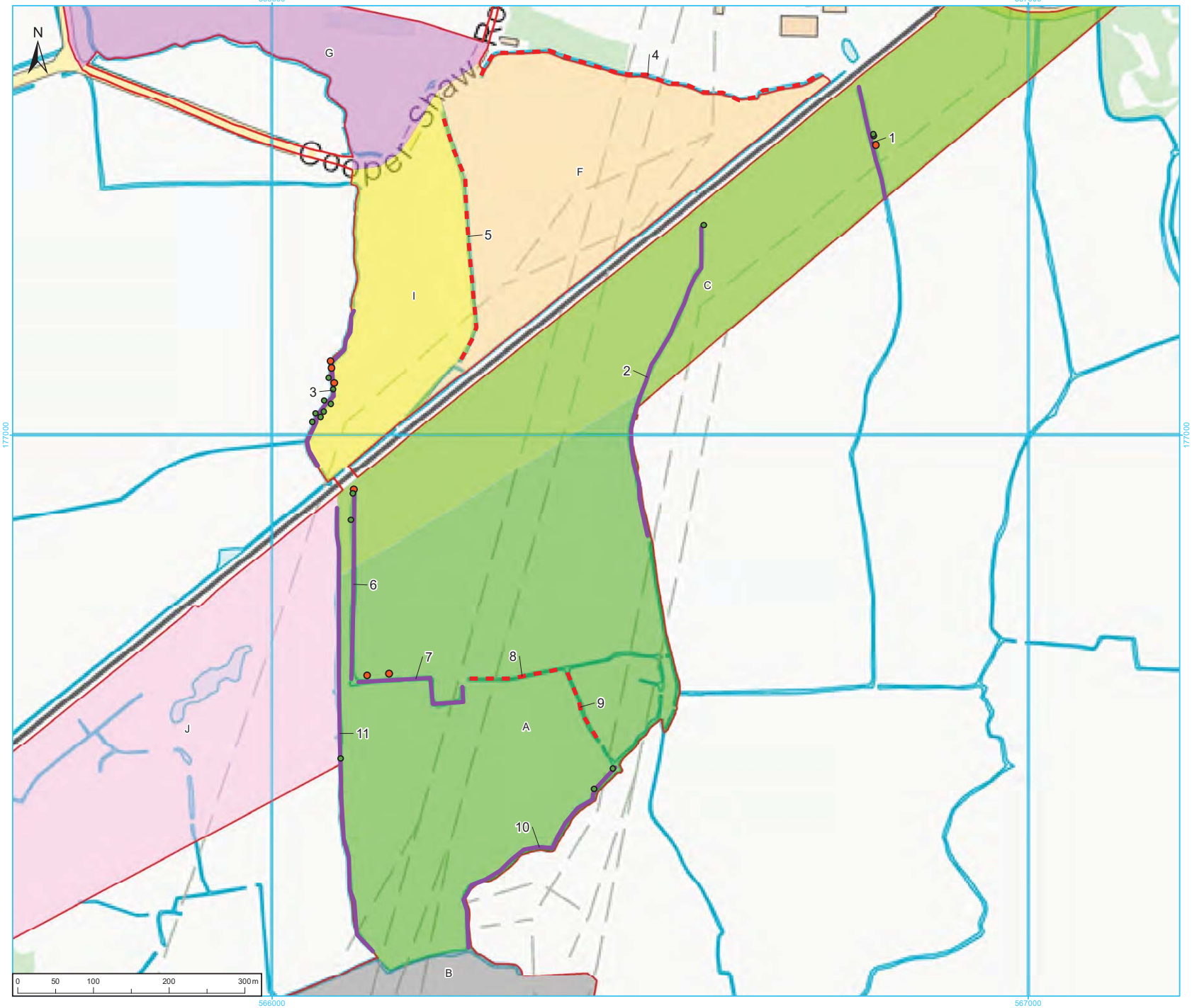
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Final	KM	MF
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ECO00110	1:11,280	JUN 18
Drawing Number		**Rev**
Figure 8.1e		A

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Figure 9.1. Water Vole survey results (April)



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Legend

- Site boundary
- Water voles present
- Water voles absent
- Latrine
- Burrow

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Presennce of water vole signs in ditches surveyed May 2018

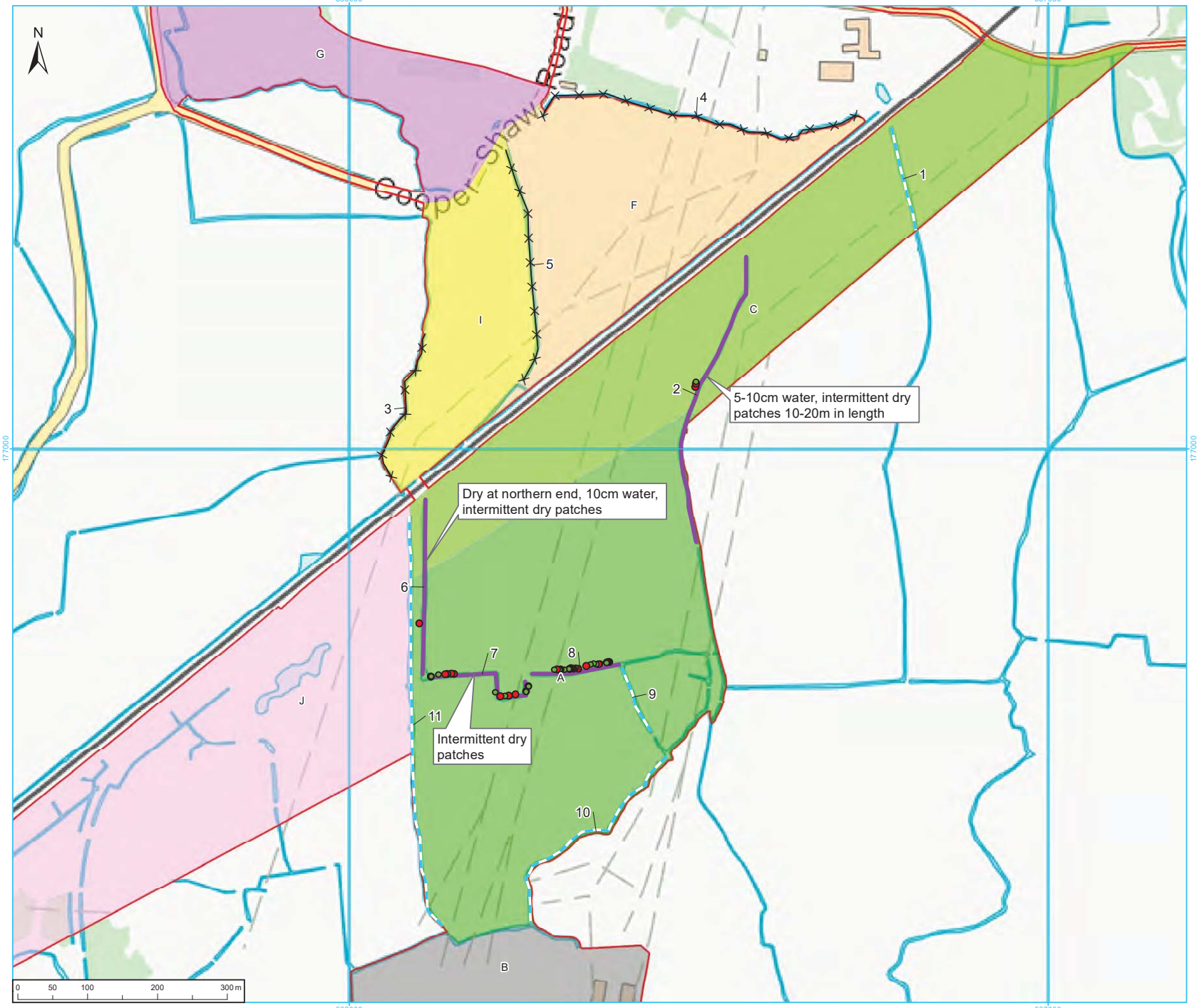
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Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
ECO00110	1:5,005	JUL 18
Drawing Number		**Rev**
Figure 9.1		A

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Figure 9.2. Water Vole survey results (July)



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Legend

- Site boundary
- Watervoles present
- Ditch dry
- Ditch not surveyed
- Burrow
- Latrine

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Presence of water vole signs in ditches surveyed July 2018

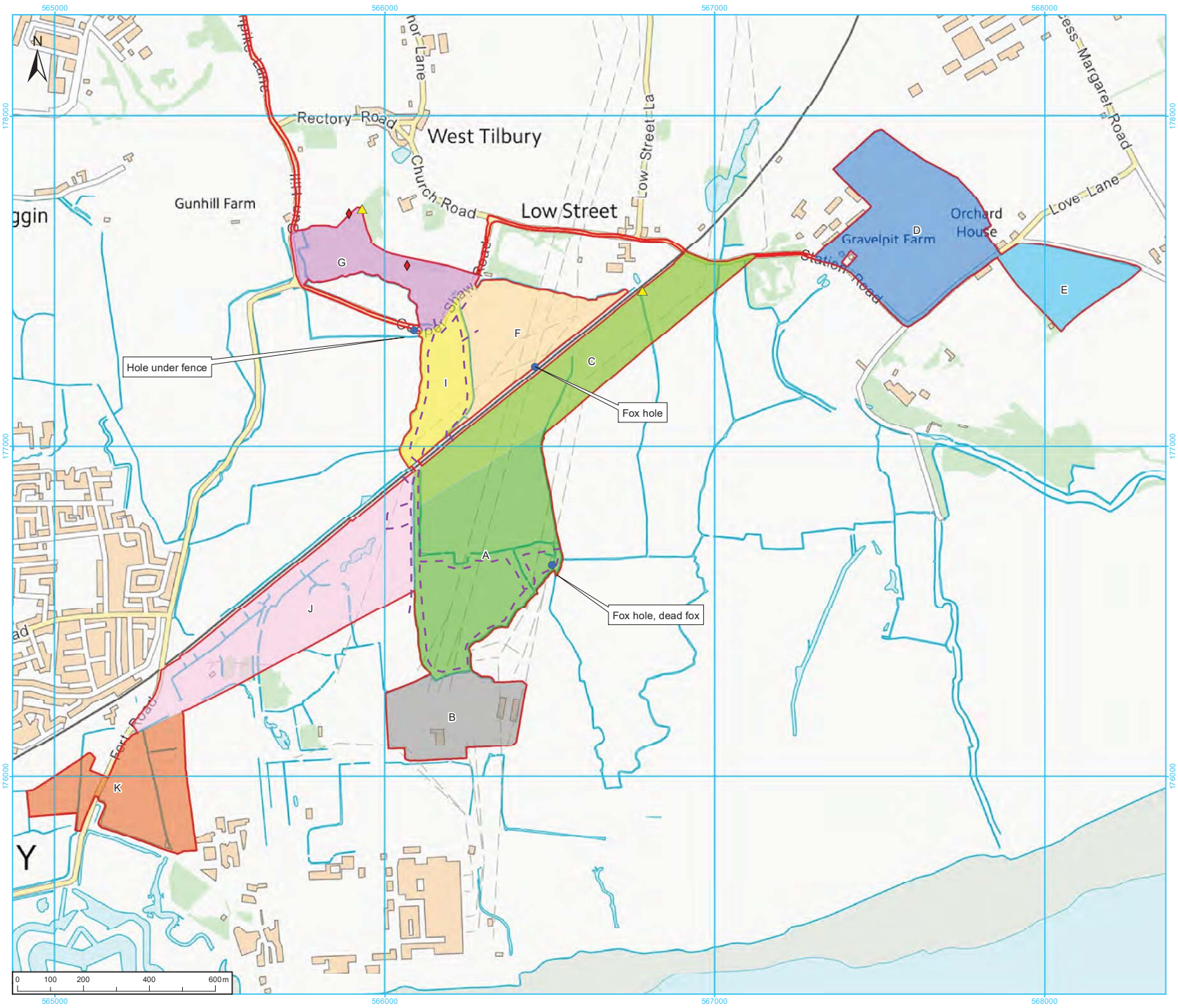
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Final	KM	MF
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Drawing Number		**Rev**
Figure 9.2		A

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Figure 10.1. Badger signs



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Legend

- Site boundary
- Feeding signs
- Latrine
- Other
- Sett
- Mammal paths

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Badger signs, May 2018

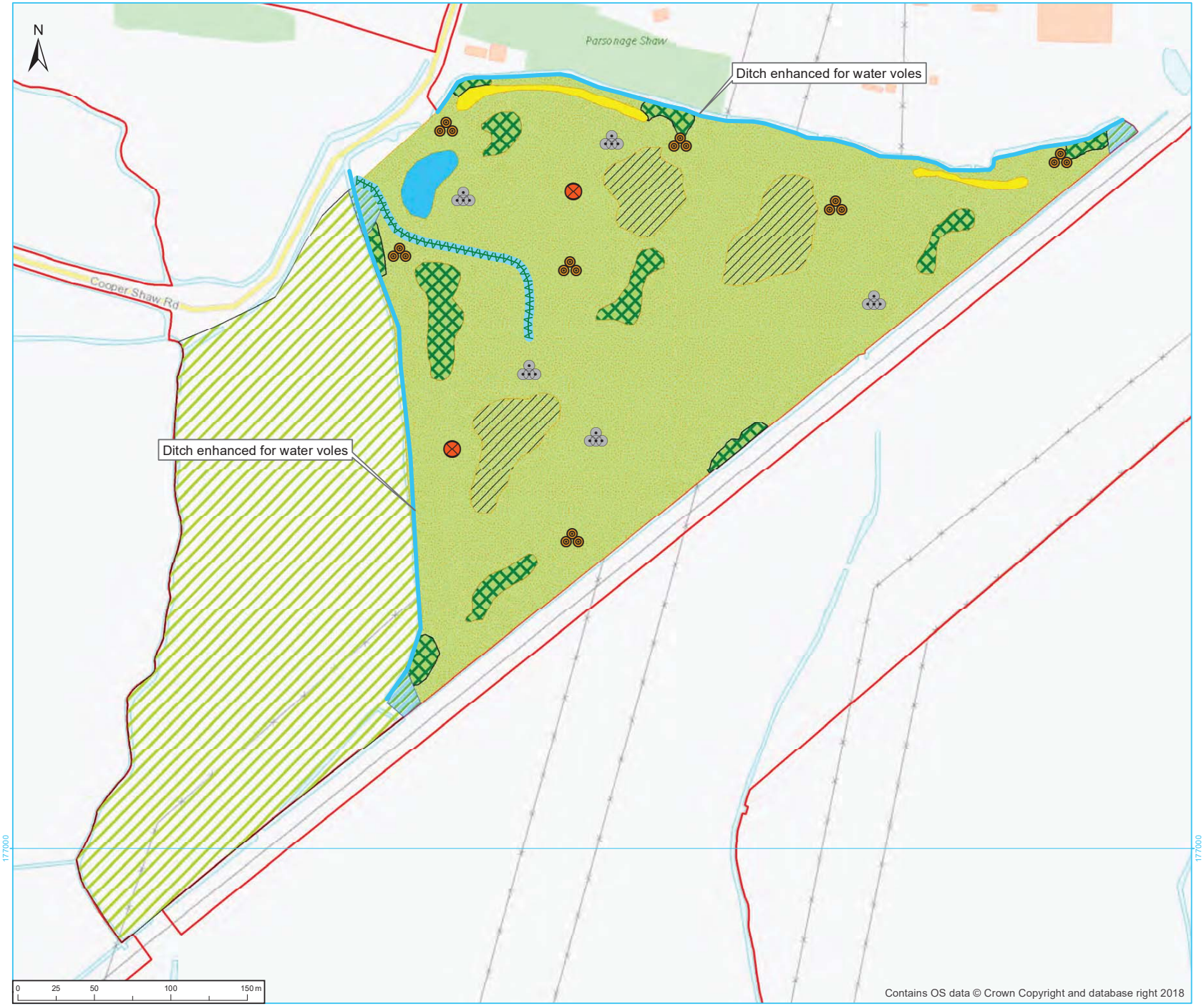
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Drawing Number		**Rev**
Figure 10.1		A

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Figure 11.1. Indicative habitat creation design



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Legend

- Site boundary
- Bee bank
- Existing Poor Semi-improved grassland
- Hummock/hollow
- Meadow grassland
- Pond
- Reed bed
- Scrub
- Existing ditch
- New ditch with hedge
- Adder hibernaculum
- Log pile
- Rubble mound

Rev	Description	Date	Initial	Checked

RPS

Willow Mere House, Compass Point Business Park
Stocks bridge Way, St. Ives, Cambs, PE27 5JL
T: 01480 466 335 **E**: rpscm@rpsgroup.com **F**: 01480 466 911

Client: Thurrock Power Ltd

Project: Thurrock Flexible Generation Plant

Title: Habitat mitigation plan
INDICATIVE ONLY

Status	Drawn By	PM/Checked By
Final	KM	MF
Job Ref	**Scale @ A3**	**Date**
ECO00110	1:2,500	JUL 18
Drawing Number		**Rev**
Figure 11.1		B

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APPENDICES

Appendix A: Relevant legislation

Great Crested Newts

Great Created Newts *Triturus cristatus* are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (and as amended), which affords the species protection under Section 9. The species is also listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2010. In combination, this makes it an offence to:

- intentionally kill, injure or take (capture etc.) a Great Crested Newt;
- possess a Great Crested Newt;

intentionally or recklessly damage, destroy, obstruct access to any structure or place used by Great Crested Newt for shelter or protection, or disturb any animal occupying such a structure or place; and sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative) or advertise for buying or selling such things.

Great Crested Newts are also listed on the UKBAP as a Priority Species and are listed as a species of principal importance for biodiversity in England & Wales under Section 41 of the Natural Environment & Rural Communities Act (2006).

Reptiles

All common UK reptile species (adder, grass snake, common lizard and slow worm) are protected through part of Section 9(1 and 5) of the Wildlife & Countryside Act 1981 (as amended). This prohibits:

- Intentional or reckless injuring or killing;
- Selling, offering or exposing for sale, or having in possession or transporting for the purpose of sale, any live or dead wild animal or any part of, or anything derived from, such an animal; or
- Publishing or causing to be published any advertisement likely to be understood as conveying buying or selling, or intending to buy or sell, any of those things.

Breeding birds

All birds, their nests and eggs are afforded protection under the Wildlife and Countryside Act 1981, as updated by the Countryside and Rights of Way Act 2000. It is an offence to:

- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; and

- intentionally take or destroy the egg of any wild bird.

Schedule 1 birds cannot be intentionally or recklessly disturbed when nesting and there are increased penalties for doing so. Licences can be issued to visit the nests of such birds for conservation, scientific or photographic purposes but not to allow disturbance during a development even in circumstances where that development is fully authorised by consents such as a valid planning permission.

Badgers

Badgers and their setts are protected under various legislation, drawn together under the Protection of Badgers Act 1992, This makes it a criminal offence to;

- wilfully kill, injure, take, possess, or cruelly ill-treat a Badger, or to attempt to;
- interfere with a sett by damaging or destroying it;
- obstruct access to, or any entrance of, a Badger sett; and
- to disturb a Badger when it is occupying a sett.

This legislation effectively prevents development on a site, or within 30m of a site, occupied by badgers without mitigation being agreed and carried out prior to construction works. If there are potential impacts on any of the setts such as disturbance or if the only option is to close the sett then a licence from Natural England would be required. It would be necessary to undertake appropriate mitigation, for example construction of an artificial sett.

Water Voles

Water Vole is listed on Schedule 5 of the Wildlife and Countryside Act 1981 (under section 9 of the Act), receiving full protection since 2008. The Wildlife and Countryside Act 1981, together with amending legislation, makes it an offence to:

- intentionally kill, injure or take (capture etc.) Water Voles;
- possess or control live or dead Water Voles or any part or derivatives;
- intentionally or recklessly damage or destroy a Water Vole's place of shelter or protection;
- intentionally or recklessly disturb a Water Vole whilst occupying a structure or place used for shelter or protection;
- intentionally or recklessly obstruct access to a Water Vole's place of shelter or protection; and
- sell, offer for sale or possession and transportation for the purposes of sale any live or dead Water Vole, or any part or derivative, or advertising any of these for buying and selling.

A place of shelter or protection includes a network of active burrows and/or any nests that have been constructed within the burrow system or above ground amongst dense vegetation.

Appendix B. Site photographs

Zone A: semi-improvied grassland



Zone A – Grassland and central ditch



Zone C – Arable field



Zone D – Arable field



Zone E – Short semi-improved grassland



Zone F – Arable field



Zone G – Arable field



Zone I – Semi-improved grassland



Zone J – Habitats developing on hard standing



Zone K – Grazing land (improved grassland)



Appendix C. Plant species recorded on semi-improved grassland

Walkover survey

Family	Species	Common Name	DAFOR abundance
Apiaceae	*Anthriscus sylvestris*	Cow Parsley	F
Apiaceae	*Heracleum spondinium*	Hogweed	O
Apiaceae	*Heracleum gigantizum*	Giant Hogweed	R
Araliaceae	*Hedera helix*	Ivy	R
Asteraceae	*Picris echioides*	Bristly Oxtounge	A
Asteraceae	*Senecio jacobaea*	Ragwort	O
Asteraceae	*Tragopogon pratensis*	Goat's-beard	R
Asteraceae	*Arctium minus*	Lesser Burdock	F
Asteraceae	*Taraxicum officinales*	Dandilion	O
Asteraceae	*Achillia milliofolium*	Yarrow	O
Asteraceae	*Anthemis cotula*	Stinking Camomile	D
Asteraceae	*Matricaria discoidea*	Pinappleweed	A
Asteraceae	*Circium arvense*	Spear Thistle	F
Asteraceae	*Hieracium agg. Sp.*	Hawkweed	F
Asteraceae	*Sonchus arvensis*	Field Milk Thistle	A
Asteraceae	*Carduus crispus*	Curled Thistle	A
Asteraceae	*Sonchus asper*	Spiney Sow Thistle	A
Brassicaceae	*Capsella bursa-pastoris*	Sheperds purse	A
Brassicaceae	*Brassica napus*	Rape	D
Chenopodiaceae	*Chenopodium album*	Fat-hen	O
Dipsacaceae	*Dipsacus fullonum*	Common Teasel	O
Equisetaceae	*Equisetum arvense*	Common Horsetail	D
Fabaceae	*Galega officinales*	Common goat's rue	O
Fabaceae	*Lotus glaber*	Narrow-leaved Birds Foot Trefoil	R
Fabaceae	*Medicago arabica*	Spotted Medick	F
Fabaceae	*Vicia cracca*	Tufted vetch	O
Fabaceae	*Trifolium repens*	White Clover	O
Geraniaceae	*Geranium molle*	Dove's-foot Crane's-bill	F
Geraniaceae	*Geranium dissectum*	Cut-leaved Crane's-bill	F
Lamiaceae	*Ballota nigra*	Black Horehound	R
Lamiaceae	*Lamium album*	White Dead-nettle	O
Malvaceae	*Malvus sylvestris*	Common Mallow	A
Plantagenaceae	*Plantago lanceolata*	Ribwort Plantain	O
Plantagenaceae	*Plantago media*	Hoary Plantain	O
Plantagenaceae	*Plantago major*	Broard-leaved Plantain	O
Poaceae	*Dactylis glomerata*	Cock's Foot	F
Poaceae	*Festuca rubra*	Red Fescue	F

Family	Species	Common Name	DAFOR abundance
Poaceae	*Phleum bartolonii*	Smaller Cat's-tail	R
Poaceae	*Bromus sterilis*	Barren Brome	F
Poaceae	*Hordeum murinum*	Wall Barley	O
Poaceae	*Phragmites australis*	Common Reed	A
Poaceae	*Lolium perenis*	Perennial Ryegrass	A
Poaceae	*Poa annua*	Annual Meadow Grass	F
Poaceae	*Holcus lanatus*	Yorkshire Fog	O
Poaceae	*Hordeum vulgare*	Barley	R
Poaceae	*Avena fatua*	Wild Oat	R
Poaceae	*Arrenatherum elatius*	False Oat-grass	D
Polygonaceae	*Rubus fruiticosus*	Bramble	A
Polygonaceae	*Polygonum aviculare*	Common Knotgrass	F
Polygonaceae	*Rumex crispus*	Curly Dock	F
Rosaceae	*Potentilla reptans*	Creeping Cinquefoil	F
Rubiaceae	*Gallium aparine*	Cleavers	O
Urticaceae	*Urtica Diota*	Common Nettle	D
Urticaceae	*Urtica urens*	Small-leaved Nettle	O
Field A Ditches			
Brassicaceae	*Rorippa nasturtium-aquaticum*	Water Cress	O
Convulvulaceae	*Convulvulus arvensis*	Bindweed	R
Cyperaceae	*Bolboschoenus maritimus*	Sea Club-rush	A
Poaceae	*Phragmites australis*	Common Reed	D
Poaceae	*Arrenatherum elatius*	False Oat-grass	D
Typhaceae	*Sparganium erectum*	Branched Bur-reed	R

NVC survey

Species	Common name	Quadrat number and DOMIN value						Domin range
		1	2	3	4	5	6	
Anthemis cotula	Stinking Camomile		5	4				4-5
Anthriscus sylvestris	Cow Parsley	2			4	4	2	2-4
Arrenatherum elatius	False Oat-grass	5			8	6	5	5-8
Ballota nigra	Black Horehound						6	6
Brassica napus	Rape		8	5				5-8
Capsella bursa-pastoris	Shepherds purse			4				4
Circium arvense	Spear Thistle					4		4
Dactylis glomerata	Cock's Foot	4			1			1-4
Dipsacus fullonum	Common Teasel						4	4
Equisetum arvense	Common Horsetail			5				5
Galega officinales	Common goat's rue						7	7
Gallium aparine	Cleavers	2						2
Lamium album	White Deadnettle	1						1
Lolium perenis	Perennial Ryegrass						5	5
Malva sylvestris	Common Mallow			5				5
Phragmites australis	Common Reed				5			5
Plantago lanceolata	Ribwort Plantain		1	1			2	1-2
Polygonum arviculare	Common Knotgrass		4		5			4-5
Potentilla reptans	Creeping Cinquefoil	7			2			2-7
Rubus fruiticisus	Bramble	2						2
Rumex crispus	Curly Dock			2		6		2-6
Senecio jacobaea	Ragwort			4				4
Sonchus arvensis	Field Milk Thistle		1					1
Taraxicum officinales	Dandilion			1				1
Urtica diota	Common Nettle	6			5	6		5-6

Appendix D. Reptile survey results (adults and juveniles)

Adults

Visit	Reptile counts (adults)																											
	Zone A				Zone C				Zone F				Zone G				Zone I				Zone J				Whole site			
	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C
1	3		2												1				1			1	3		3	1	7	
2	2		13	1				1												2			3		2		16	4
3	2		4	1								1			1					1			3	2	2		8	5
4	2	1	6	1			1				1				1				2	5			4		2	1	15	6
5	4		8	2			3	2			4				9				1				9		4		34	4
6	2		13		2		6				1				1				2				4		4		27	
7	1		3	4			4				1				6				1				2		1		17	4

Juveniles

Visit	Reptile counts (juveniles)																											
	Zone A				Zone C				Zone F				Zone G				Zone I				Zone J				Whole site			
	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C	A	G	S	C
1	4		5			1								1							1	1			5	3	5	
2	1		5				2							1									1		2	1	8	
3	4	1	6																		1				5	1	6	
4	3		12	1			3				4				1				2						3		22	1
5	3	1	19			1	2			1											1				4	3	21	
6	2	2	11			1	2				1								2				2		2	3	18	

Appendix E: Baseline Sound Monitoring Report

Baseline Sound Monitoring Report

Tilbury

For Thurrock Power Ltd

Report No. JAT10265-BR-01-R0

23 March 2018









Quality Management

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Appendix A – Survey Record Sheets
Appendix B – Baseline Survey Results: Summary Tables & Time Histories
Appendix C – Baseline Survey Results: Short Term Attended Measurements

1 Introduction

1.1 RPS has been commissioned by Thurrock Power Ltd to undertake baseline noise monitoring to inform the noise impact assessment for a proposed flexible generation plant comprising gas engines and battery storage near Tilbury (the Proposed Development).

1.2 This report provides the results of baseline sound measurements undertaken to characterise the sound environment in the vicinity of the nearest Noise Sensitive Receptors (NSRs) to the Proposed Development including its potential road access and supply gas pipeline routes. These baseline levels will be used in the assessment of effects for the operational and construction noise and vibration assessments to be reported in the Environmental Statement (ES).

1.3 Access to all survey locations was agreed with the landowners. The surveys were undertaken between Thursday 1st and Wednesday 21st February 2018.

1.4 This report provides a summary of the survey data for each survey location. As stated above, these levels will be relied upon within the assessment carried out for the ES. Survey sheets indicating details and locations of noise monitoring equipment are provided in Appendix A.

2 Baseline Survey Methodology

Consultation with LPA

2.1 The proposed approach to the baseline surveys was described in the Baseline Noise Monitoring Plan (ref. JAT9473-MS-01-R0) issued on 18th January 2018. The survey methodology was subject to consultation and was agreed to be appropriate by Mark Gentry, Environmental Health Officer for Thurrock Council.

Survey Locations

2.2 Survey locations were chosen to characterise baseline conditions in the vicinity of the nearest noise sensitive receptors to the Proposed Development and based on their proximity to the site. The proposed monitoring were as follows:

- **LT1 – Byron Gardens:** This location is approximately 750 m west of the Proposed Development and is representative of the residential properties west of Fort Road. It is proposed to undertake long-term noise monitoring at this location supplemented by attended short-term measurements.
- **LT2 – Buckland:** This location is approximately 1 km east-north-east of the Proposed Development and is representative of the residential properties in this area. It is proposed to undertake long-term noise monitoring at this location supplemented by attended short-term measurements.
- **LT3 – Walnut Tree Farm:** This location is approximately 840 m north-north-east of the Proposed Development and is representative of the residential properties in this area. It is proposed to undertake long-term noise monitoring at this location supplemented by attended short-term measurements.
- **LT4 – St James Church:** This location is approximately 1 km north of the Proposed Development and is representative of the church and town hall as well as the wider settlement of West Tilbury. It is proposed to undertake long-term noise monitoring at this location supplemented by attended short-term measurements.
- **ST5 – Tilbury Fort:** This location is approximately 1.2 km south-west of the Proposed Development and is representative of the Fort which is controlled by English Heritage and operated as a tourist attraction. It is proposed to undertake short-term noise monitoring at this location during the daytime.
- **ST6 – Sandhurst Road:** This location is approximately 850 m west of the Proposed Development and is representative of the residential properties west of Fort Road but nearer to the railway line and existing industrial areas than those properties at Byron Gardens. It is proposed to undertake short-term noise monitoring at this location.
- **LT7 – Goshem's Farm:** This location is approximately 1.6 km north east of the Proposed Development and close to the potential gas connection compound and is representative of

the residential properties in the area. It is proposed to undertake long-term noise monitoring at this location supplemented by attended short-term measurements.

2.3 Table 2.1 provides a summary of the baseline survey locations and grid co-ordinates of where the survey equipment was positioned. All survey locations are identified in Figure 2.1 overleaf.

Table 2.1 - Survey Locations

Ref.	Long Term / Short- Term	Representative Address	Coordinates	
			Easting	Northing
LT1	LT	143 Byron Gardens	565355	176550
LT2	LT	Buckland	567531	177202
LT3	LT	Walnut Tree Farm	566753	177610
LT4	LT	St James Church	566129	177695
ST5	ST	Tilbury Fort	564870	175222
ST6	ST	Sandhurst Road	565283	176332
LT7	LT	Goshem's Farm	567819	177511

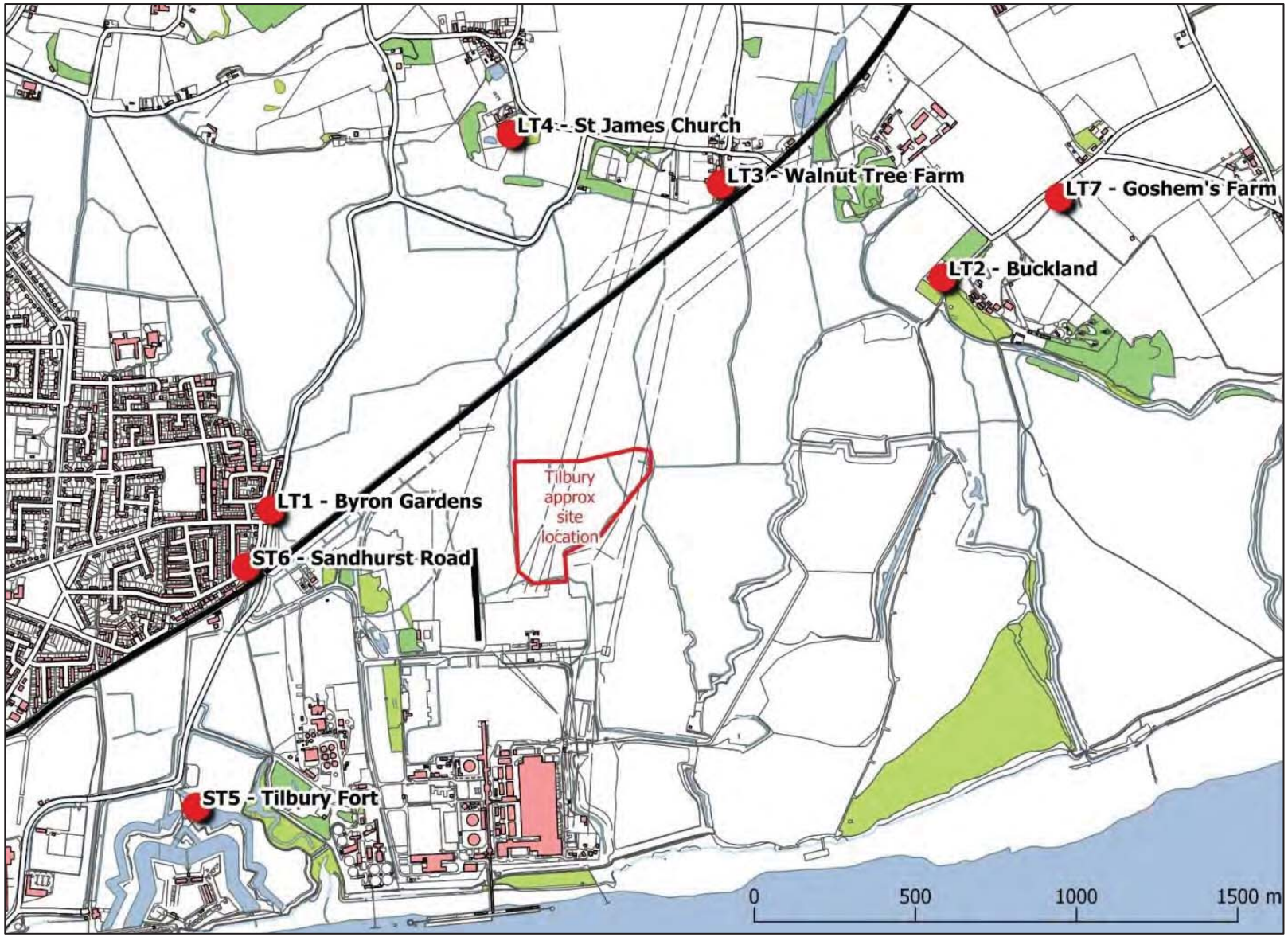


Figure 2.1 Baseline Survey Locations

Baseline Survey Procedure

2.4 Long term unattended baseline sound level monitoring was undertaken between Thursday 1st and Wednesday 21st February 2018 at 5 locations in closest proximity to the Proposed Development. At each long term survey location, concurrent, short-term, attended surveys were carried out during the day (0700 - 1900 hours), evening (1900 – 2300 hours) and night-time (2300 – 0700 hours) periods. Attended short term surveys were also undertaken at two additional locations.

2.5 All sound level monitoring was carried out using one of the following 'Class 1' sound level meters (SLM): Rion NL-52, Rion NA-28 or Rion NL-31. Each SLM was checked for calibration prior to and immediately following the survey with no significant deviation found. At the long term monitoring locations, continuous data were logged of the fast time weighted, A-weighted, broadband sound pressure levels in 100 ms periods. Short-term attended survey data were logged of the fast time weighted, A-weighted, broadband sound pressure levels in 15 minute periods.

2.6 The long term surveys were established during the day and observations made of sources and other conditions in accordance with the requirements of British Standard (BS) 4142:2014 'Methods for rating and assessing industrial and commercial sound' [1]. As a minimum, the following noise parameters were recorded; L_{Aeq}, L_{Amax}, L_{A10} and L_{A90}. Third octave band measurements were carried out at all locations, with the exception of ST6, to determine the frequency content of the baseline sound. It is considered that spectral data acquired at LT1 is representative of ST6.

2.7 In addition to each long term survey location, concurrent attended surveys were carried out during the day (0700-1900), evening (1900-2300) and night-time (2300-0700) periods. Short-term attended surveys consisted of the following: three 15 minute discontinuous periods during the daytime; one 15 minute period during the evening; and three 15 minute periods during the night-time.

2.8 Long term surveys were undertaken following guidance contained in BS 7445-2:1991 'Description and measurement of environmental noise, Part 2: Guide to the acquisition of data pertinent to land use' [2].

2.9 Meteorological conditions were monitored during the long-term surveys with an unattended weather station installed at LT2. Average wind speeds did not exceed 5 m/s during the survey period. There were no significant periods of precipitation. Some limited light precipitation was recorded on 2nd February 2018 however this did not have a significant influence on the measured sound levels. Therefore no data have been excluded from the dataset due to adverse weather conditions.

2.10 Meteorological conditions were also measured during each short-term attended measurement using a hand held anemometer.

3 Baseline Survey Details & Results

3.1 Survey record sheets for each survey location detailing the position of the noise monitors are presented in Appendix A. Time histories of the measured sound levels and meteorological conditions during the survey period are presented in Appendix B. Results of the short term attended monitoring are presented in Appendix C.

4 Discussion of Results

Determining Representative Baseline Levels

4.1 To ascertain the typical sound levels at the measurement locations, time history plots have been produced and presented for each long term monitoring position. These are presented with the summary results tables in Appendix B. The summaries of results in Appendix B are based on analysis of the measured sound levels processed into 15 minute samples.

4.2 Representative baseline sound levels will be determined, where possible, from long term monitoring survey locations. For receptor locations where long term monitoring was not undertaken, the baseline sound levels will be determined from short-term survey data. The data obtained will be analysed and compared against other datasets in order to obtain a representative baseline sound level.

Operational Noise Assessment

4.3 BS 4142:2014 requires that the background sound levels adopted for the assessment be representative for the period being assessed. The Standard recommends that the background sound level should be derived from continuous measurements of normally not less than 15-minute intervals, which can be contiguous or disaggregated. However, the Standard states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night-time period because it can be subject to a wide variation in background sound levels between the shoulder night periods. The accompanying note to paragraph 8.1.4 states that:

"a representative level ought to account for the range of background sounds levels and ought not automatically to be assumed to be either the minimum or modal value".

4.4 In determining representative baseline noise levels for receptors identified within the Environmental Statement, it will be necessary to analyse each location individually to ensure the most representative level is considered. BS 4142:2014 states that:

"In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods."

Construction Noise Assessment

4.5 To determine the most representative ambient sound levels, the equivalent continuous A-weighted sound pressure level, L_{Aeq}, will be calculated based on standard construction hours and presented as a logarithmic average of the 15-minute period data over the relevant time periods.

Appendices

Appendix A – Survey Record Sheets

Sound Level Survey Record (Long Term Survey)

Location			LT1: 143 Byron Gardens			
Purpose of Monitoring			Baseline			
Relevant Guidance / Standard			BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014			
Sound Measurement System						
RPS ID	Manufacturer / Model		Serial Number	Last Lab Verification	Filename	Memory Card ID
115	Rion NL-52		943366	29/01/2018	Auto_0001	
Microphone Height	Measurement Interval	Dynamic Range	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.5 m	100 ms	25 - 138	Fast	A	Freefield	x

		START	END
Personnel		PB	PB
Date / time		01/02/2018 14:45	21/02/2018 12:15
Calibrator	RPS ID	15	15
	Manufacturer / Model	RION NC-74	RION NC-74
	Serial Number	110090	110090
	Date last verification	17/11/2017	17/11/2017
	Reference level	94	94
	Meter reading	94	93.8
Weather	Cloud cover (100%= 8 oktas)	5	4
	Temperature (degrees Celsius)	9	7
	Subjective description / additional details	Sunny cold, still, damp ground	6ºC

Photographs of Measurement Location





Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))
Long term in the corner of a garden, adjacent to road, grass between SLM and road
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Road traffic on the main road dominant. Some typical residential sound in wider area but survey location mainly affected by traffic movements. Some wind russle and aircraft
Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Road traffic on the main road dominant. Some typical residential sound in wider area but survey location mainly affected by traffic movements. Some wind russle and aircraft

Sound Level Survey Record (Long Term Survey)

Location			LT2: Buckland			
Purpose of Monitoring			Baseline			
Relevant Guidance / Standard			BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014			
Sound Measurement System						
RPS ID	Manufacturer / Model		Serial Number	Last Lab Verification	Filename	Memory Card ID
116	Rion NL-52		943367	27/01/2017	Auto_0002	
Microphone Height	Measurement Interval	Dynamic Range	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.5 m	100 ms	25 - 138	Fast	A	Freefield	x

		START	END
Personnel		PB	PB
Date / time		01/02/2018 13:30	21/02/2018 12:00
Calibrator	RPS ID	15	15
	Manufacturer / Model	RION NC-74	RION NC-74
	Serial Number	110090	110090
	Date last verification	17/11/2017	17/11/2017
	Reference level	94	94
	Meter reading	94	94
Weather	Cloud cover (100%= 8 oktas)	5	4
	Temperature (degrees Celsius)	9	7
	Subjective description / additional details	Sunny cold, still, damp ground	6ºC

Photographs of Measurement Location



Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))
Scrub adjacent to dirt road, in farm yard, near to barns
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Wind rustle, metal recycling (continuous), birds, 1 gun shot, ocassional aircraft. Industrial noise fairly audible, both from the docks area and nearby metal recycling, otherwise fairly normal rural
Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Wind rustle, metal recycling (continuous), birds, ocassional aircraft. Industrial noise fairly audible, both from the docks area and nearby metal recycling, otherwise fairly normal rural

Sound Level Survey Record (Long Term Survey)

Location			LT3: Walnut Tree Farm			
Purpose of Monitoring			Baseline			
Relevant Guidance / Standard			BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014			
Sound Measurement System						
RPS ID	Manufacturer / Model		Serial Number	Last Lab Verification	Filename	Memory Card ID
126	Rion NL-52		164423	13/04/2017	Auto_0003	
Microphone Height	Measurement Interval	Dynamic Range	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.5 m	100 ms	25 - 138	Fast	A	Freefield	x

		START	END
Personnel		PB	PB
Date / time		01/02/2018 14:20	21/02/2018 11:45
Calibrator	RPS ID	15	15
	Manufacturer / Model	RION NC-74	RION NC-74
	Serial Number	110090	110090
	Date last verification	17/11/2017	17/11/2017
	Reference level	94	94
	Meter reading	94	93.8
Weather	Cloud cover (100%= 8 oktas)	5	4
	Temperature (degrees Celsius)	9	7
	Subjective description / additional details	Sunny cold, still, damp ground	6ºC

Photographs of Measurement Location





Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))
Garden adjacent to access road
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Soundscape similar to LT2 but a much higher percentage of HGV traffic dominating. Trains are also audible, and metal recycling facility. Regular HGVs to industrial units
Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Local roads, continuous from metal recycling, birds

Sound Level Survey Record (Long Term Survey)

Location			LT4: St James Church			
Purpose of Monitoring			Baseline			
Relevant Guidance / Standard			BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014			
Sound Measurement System						
RPS ID	Manufacturer / Model		Serial Number	Last Lab Verification	Filename	Memory Card ID
113	Rion NL-52		943364	27/01/2017	Auto_0004	
Microphone Height	Measurement Interval	Dynamic Range	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.2 m	100 ms	25 - 138	Fast	A	Freefield	x

		START	END
Personnel		PB	PB
Date / time		01/02/2018 15:25	21/02/2018 11:30
Calibrator	RPS ID	15	15
	Manufacturer / Model	RION NC-74	RION NC-74
	Serial Number	110090	110090
	Date last verification	17/11/2017	17/11/2017
	Reference level	94	94
	Meter reading	94	93.8
Weather	Cloud cover (100%= 8 oktas)	5	4
	Temperature (degrees Celsius)	9	7
	Subjective description / additional details	Sunny cold, still, damp ground	6ºC

Photographs of Measurement Location





Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))
Rear garden area of church. Soft ground in general area and towards site. Church on top of hill and elevated above general area.
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Relatively quiet, distant traffic and industry, some local traffic
Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Birds, distant traffic, metal recycling, local traffic

Sound Level Survey Record (Attended Baseline Survey)

Location	ST5: Tilbury Fort
Purpose of Monitoring	Baseline
Relevant Guidance / Standard	BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014

Sound Measurement System

RPS ID	Manufacturer / Model	Serial Number	Last Lab Verification	Filename	Memory Card ID
24	RION NL-31	352030	20/11/2017	AUT_0101-0401	-

Microphone Height	Measurement Interval	Dynamic Range (dB)	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.5 m	15 min	20 - 110	F	A	Freefield	✓

		START	END
Personnel		CB	PB
Date / time		01/02/2018 16:25	02/02/2018 10:11
Calibrator	RPS ID	15	14
	Manufacturer / Model	RION NC-74	RION NC-74
	Serial Number	110090	110118
	Date last verification	17/11/2017	03/10/2017
	Reference level	94	94
	Meter reading	94.0	94.0

Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))	
ST5	Path leading to Tilbury fort, grass, docklands to south and west, fort to east and open fields to the north
1, 2 Day, 3 Evening, 4 Day	

Observations Log

Measurement + start time	Description of sound environment (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)	Weather: Wind Speed (m/s)	Wind Direction	Cloud cover (oktas)	Temp. (degrees C)	Relative Humidity (%)	Likely temp. inversion?	Precipitation	Fog	Ground cover (Wet / Frozen / Snow)
1 16:25	Lorry movements and engine noise, distant traffic and aircraft, distant voices from docklands. Docklands - vehicles movements, reversing alarms, horns	2.5	W	8	6ºC	-	'	'	'	Dry
2 17:21	Distant traffic, wind, water moving, distant aircraft, barges, distant reverse alarm	2.5	W	8	4ºC	-	'	Light	'	Dry
3 21:23	Industry, distant traffic, distant horns	3.0	W	8	4ºC	-	'	'	'	Dry
4 09:56	Distant traffic, port sounds, engines, clanging, alarms etc, distant aircraft	2.0	W	6	2ºC	-	'	'	'	Dry

Sound Level Survey Record (Attended Baseline Survey)

Location	ST6: Sandhurst Road
Purpose of Monitoring	Baseline
Relevant Guidance / Standard	BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014

Sound Measurement System

RPS ID	Manufacturer / Model	Serial Number	Last Lab Verification	Filename	Memory Card ID
100	RION NA-28	1291243	13/10/2016	MAN_0001	-

Microphone Height	Measurement Interval	Dynamic Range (dB)	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.5 m	15 min	20 - 110	F	A	Freefield	✓

		START	END
Personnel		CB	CB
Date / time		01/02/2018 15:12	02/02/2018 11:50
Calibrator	RPS ID	14	14
	Manufacturer / Model	RION NC-74	RION NC-74
	Serial Number	110118	110118
	Date last verification	03/10/2017	03/10/2017
	Reference level	94	94
	Meter reading	94.0	94.0

Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))	
ST6	Layby off residential street, adjacent to railway and small industrial yard (likely HGV storage), broken concrete/asphalt ground bordered in scrubland.
1 Day, 2 Evening, 3 4 5 Night, 6 7 Day	

Observations Log

Measurement + start time	Description of sound environment (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)	Weather								
		Wind Speed (m/s)	Wind Direction	Cloud cover (oktas)	Temp. (degrees C)	Relative Humidity (%)	Likely temp. inversion?	Precipitation	Fog	Ground cover (Wet / Frozen / Snow)
1 17:12	Main road dominant, distant road apparent, distant planes. Train @ +7mins	2.5	W	8	6ºC	-	'	Light	'	
2 21:45	Distant motorways, very occasional local traffic, railway powerlines hum, Trains @ +2min, +8mins	2.5	W	8	4ºC	-	'	'	'	Dry
3 23:00	Distant motorways, very occasional local traffic, railway powerlines hum	3.0	W	8	4ºC	-	'	'	'	Dry
4 00:08	Distant motorways, very occasional local traffic, railway powerlines hum	2.0	W	8	2ºC	-	'	'	'	Dry
5 01:25	Distant motorways, very occasional local traffic, railway powerlines hum	2.0	W	8	2ºC	-	'	'	'	Dry
6 09:30	Distand road and aircraft, car idling nearby. Scraping (shovels on road surface). Car alarm and train together @+12mins	3.0	W	6	6ºC	-	'	'	'	Dry
7 11:35	Distant roads, occasional local traffic	2.5	W	6	6ºC	-	'	'	'	Dry

Sound Level Survey Record (Long Term Survey)

Location			LT7: Goshem's Farm			
Purpose of Monitoring			Baseline			
Relevant Guidance / Standard			BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014			
Sound Measurement System						
RPS ID	Manufacturer / Model		Serial Number	Last Lab Verification	Filename	Memory Card ID
-	Rion NL-52		510148	-	Auto_0007	
Microphone Height	Measurement Interval	Dynamic Range	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.2 m	100 ms	25 - 138	Fast	A	Freefield	x

		START	END
Personnel		PB	PB
Date / time		01/02/2018 13:30	21/02/2018 12:00
Calibrator	RPS ID	15	15
	Manufacturer / Model	RION NC-74	RION NC-74
	Serial Number	110090	110090
	Date last verification	17/11/2017	17/11/2017
	Reference level	94	94
	Meter reading	94	94.2
Weather	Cloud cover (100%= 8 oktas)	5	4
	Temperature (degrees Celsius)	9	7
	Subjective description / additional details	Sunny cold, still, damp ground	6ºC

Photographs of Measurement Location





Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))

Tied to fence, scrubland behind farmhouse

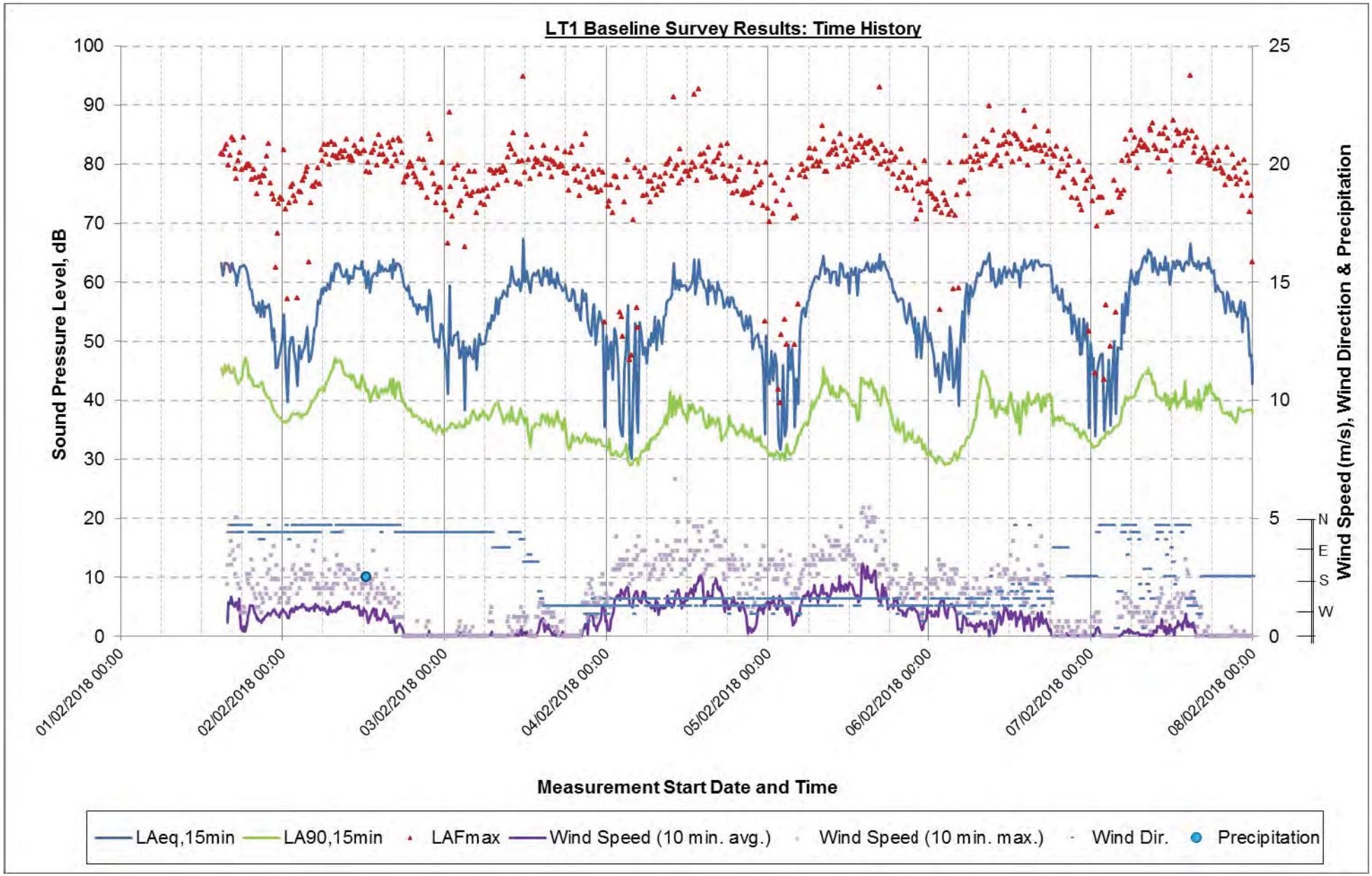
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)

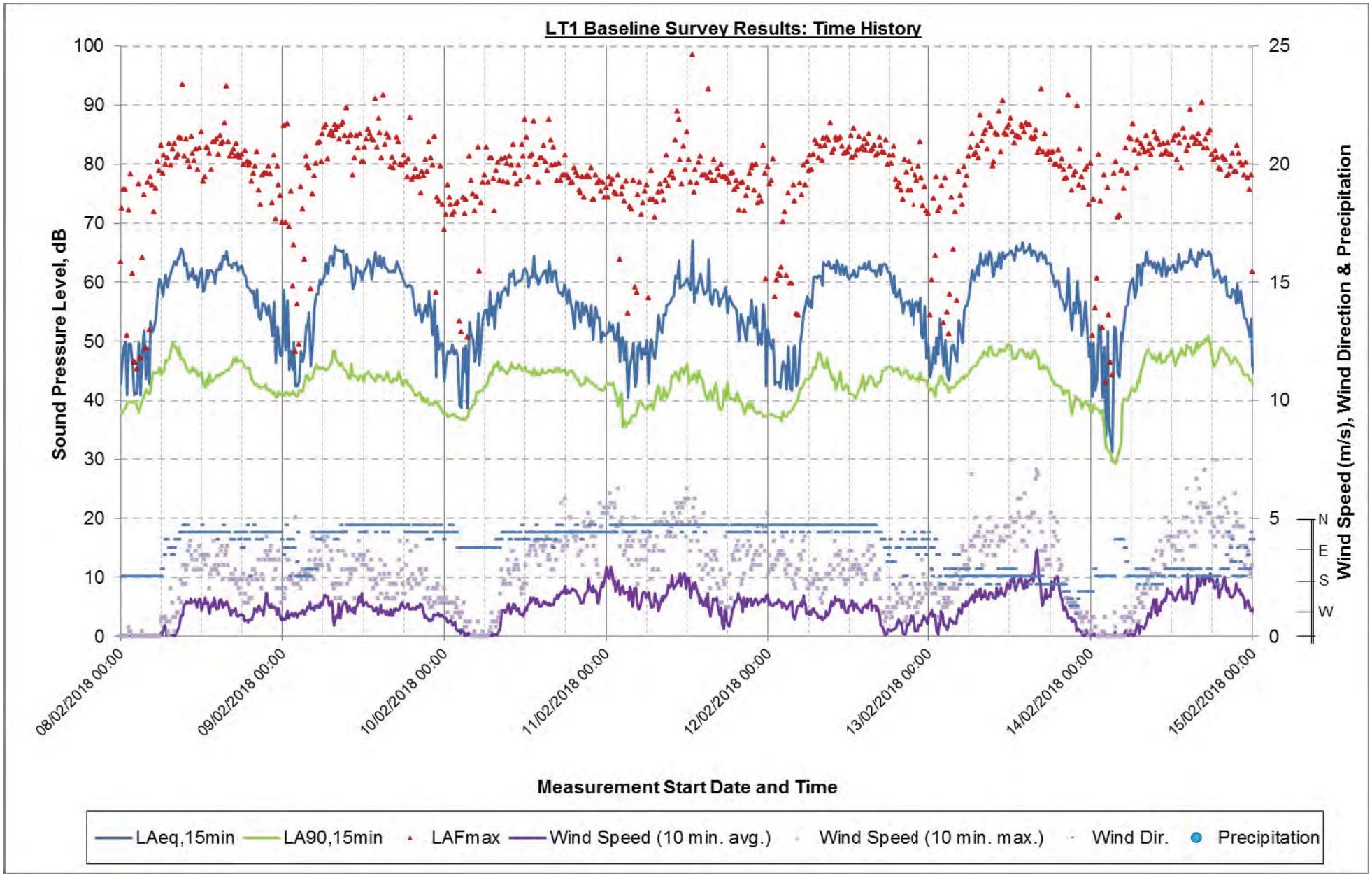
Wind rustle, metal recycling (continuous), birds, ocassional aircraft. Industrial noise fairly audible, and local road traffic more noticeable here. Car repair garage nearby is audible during the daytime

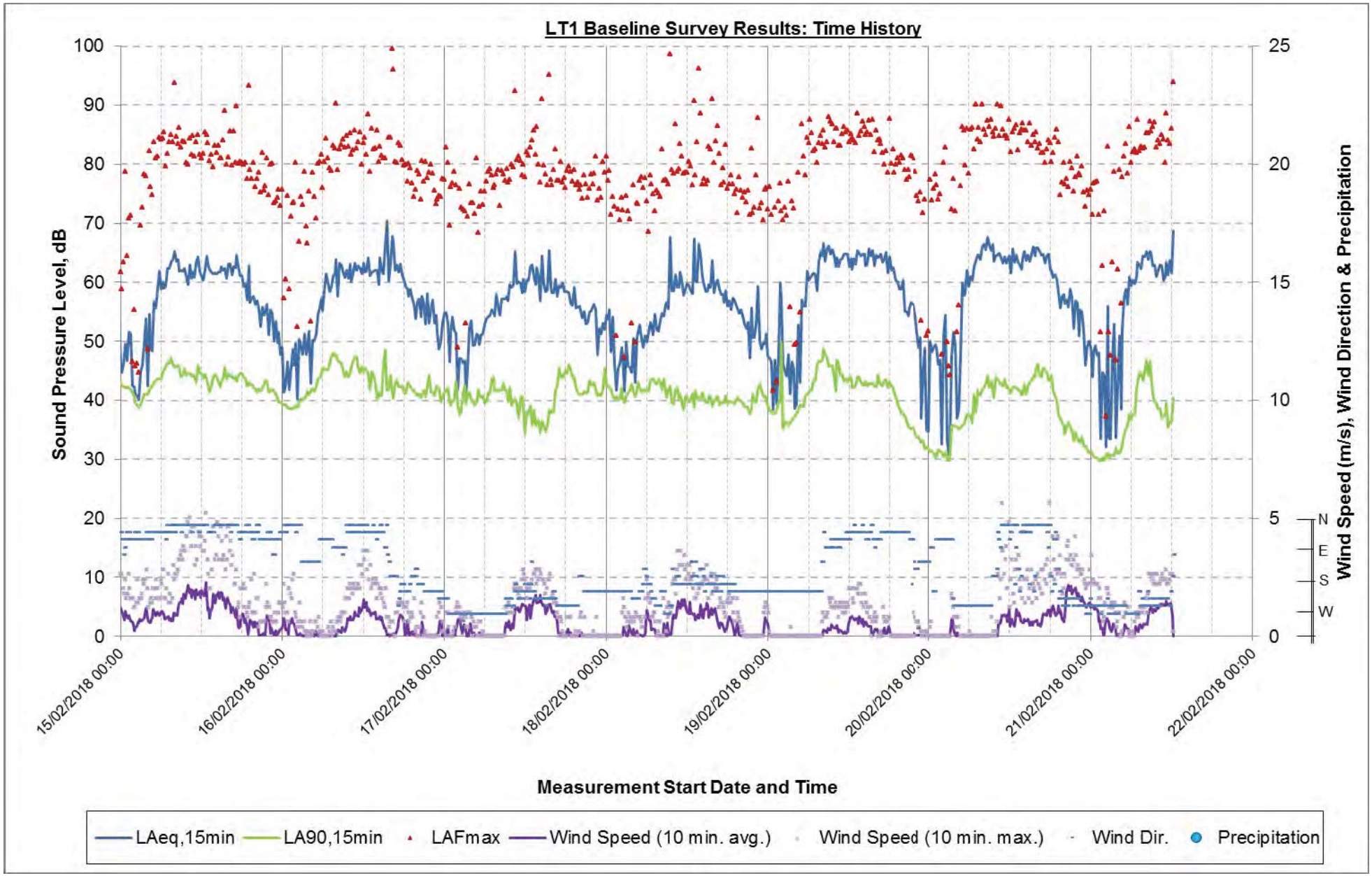
Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)

Wind rustle, metal recycling (continuous), birds, ocassional aircraft. Industrial noise fairly audible, and local road traffic more noticeable here. Car repair garage nearby is audible.

Appendix B – Baseline Survey Results: Summary Tables & Time Histories

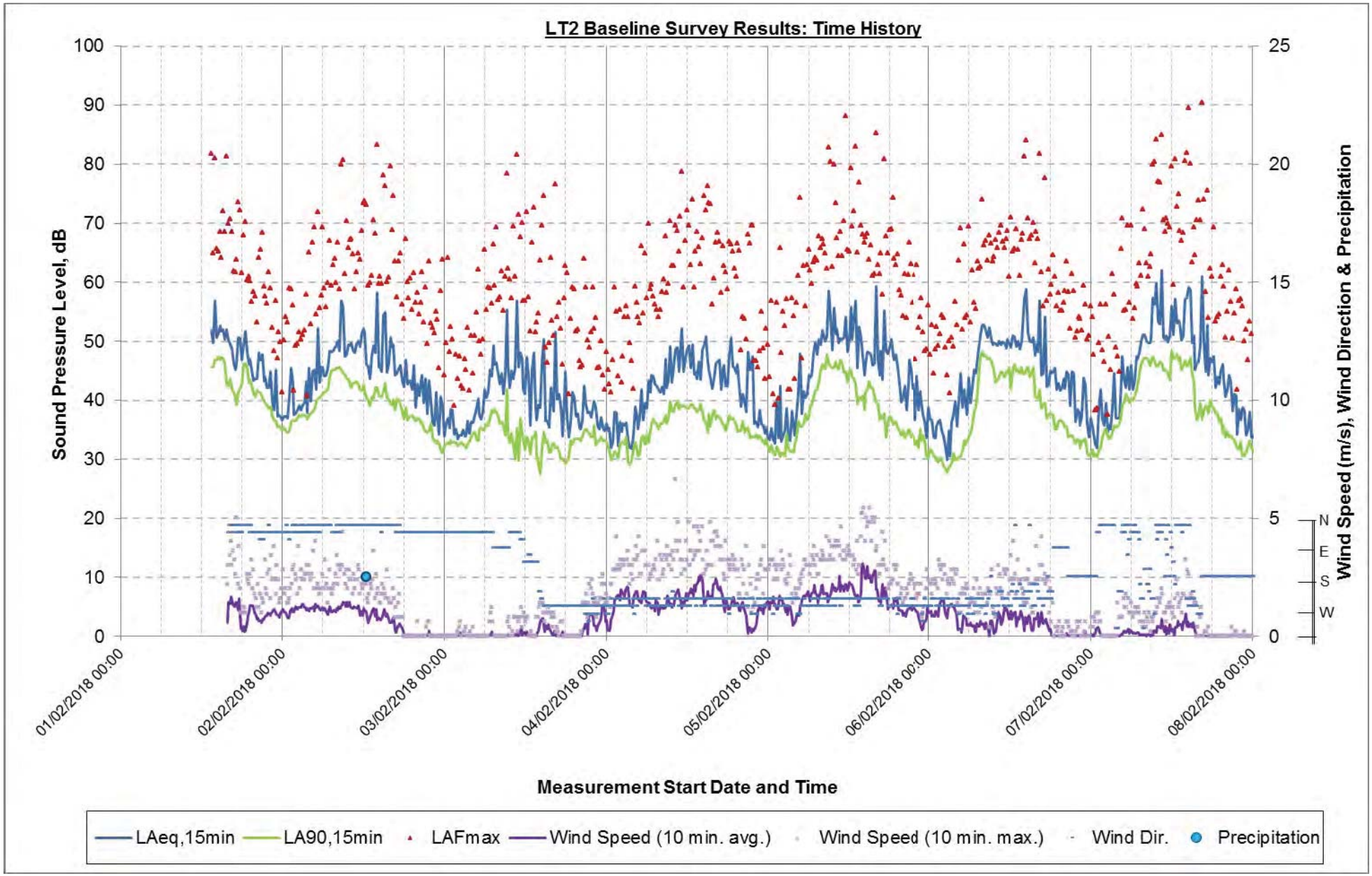

LT1 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
Measurement Start Date and Time
01/02/2018 00:00
02/02/2018 00:00
03/02/2018 00:00
04/02/2018 00:00
05/02/2018 00:00
06/02/2018 00:00
07/02/2018 00:00
08/02/2018 00:00
N
E
S
W
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

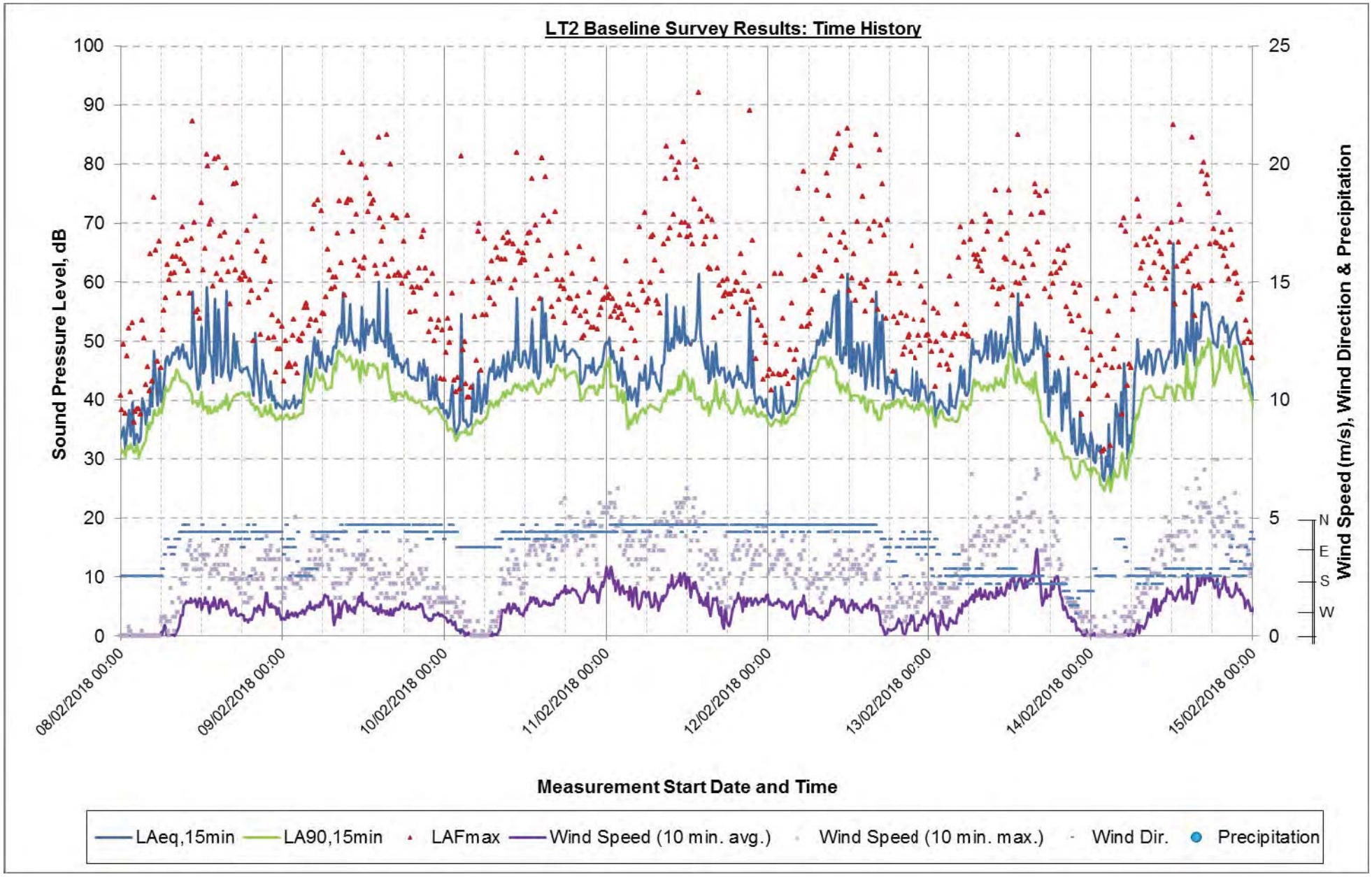

LT1 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
08/02/2018 00:00
09/02/2018 00:00
10/02/2018 00:00
11/02/2018 00:00
12/02/2018 00:00
13/02/2018 00:00
14/02/2018 00:00
15/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

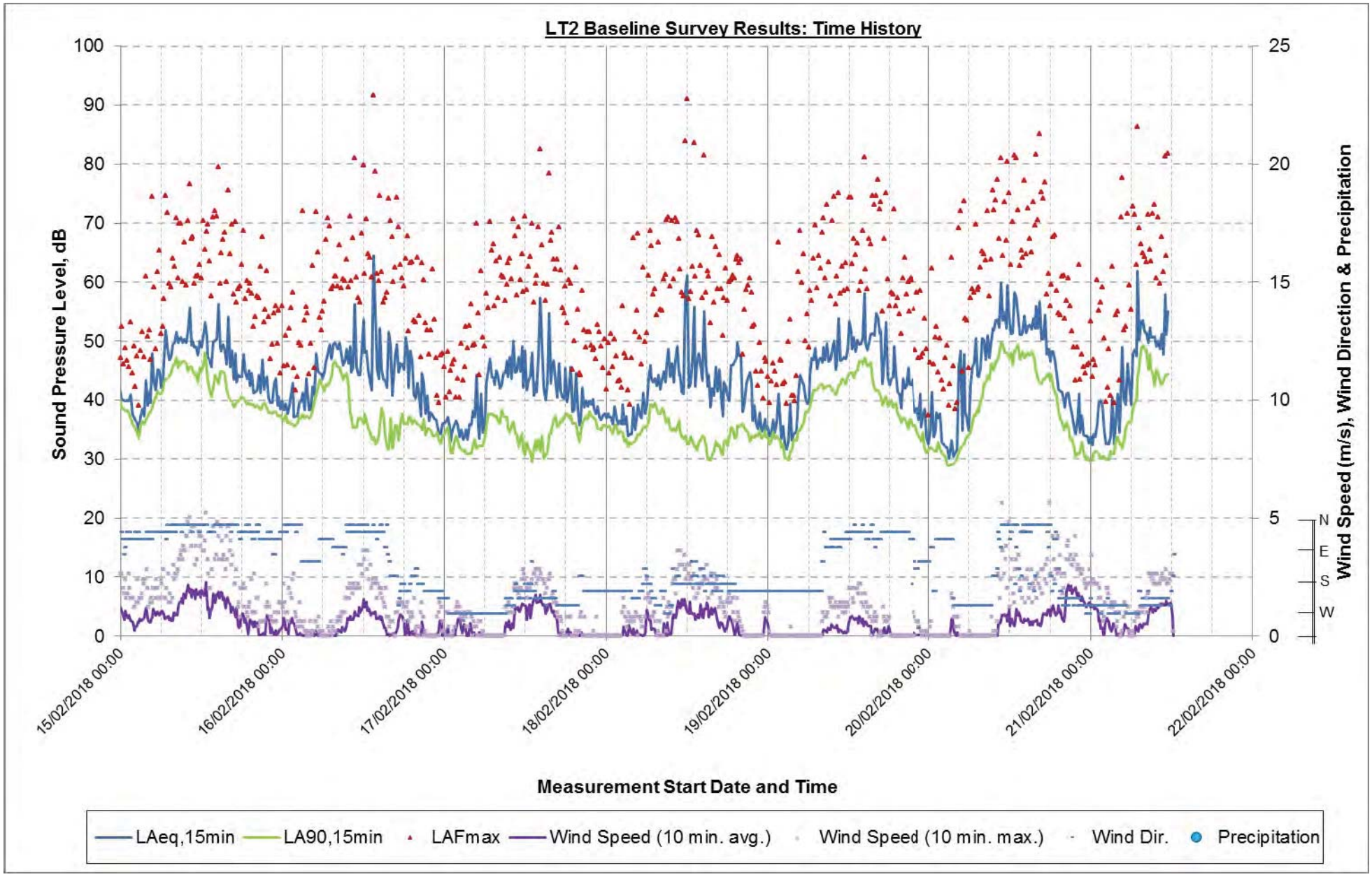

LT1 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
15/02/2018 00:00
16/02/2018 00:00
17/02/2018 00:00
18/02/2018 00:00
19/02/2018 00:00
20/02/2018 00:00
21/02/2018 00:00
22/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

LT1: Baseline Survey Results: Summary

	Residual sound, dB $L_{Aeq,T}$			Background sound, dB $L_{A90,T}$			Maximum sound, dB $L_{AFmax,T}$		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
Range	47 - 70	44 - 63	30 - 63	32 - 51	33 - 49	29 - 50	71 - 101	58 - 93	37 - 89
25th percentile	60	54	46	40	36	35	80	76	71
Median	62	56	50	43	40	39	82	78	75
75th percentile	63	57	53	45	42	42	84	80	79
Arithmetic Average	61	55	49	43	39	38	82	78	72
Standard deviation	3	3	6	4	4	4	4	3	10

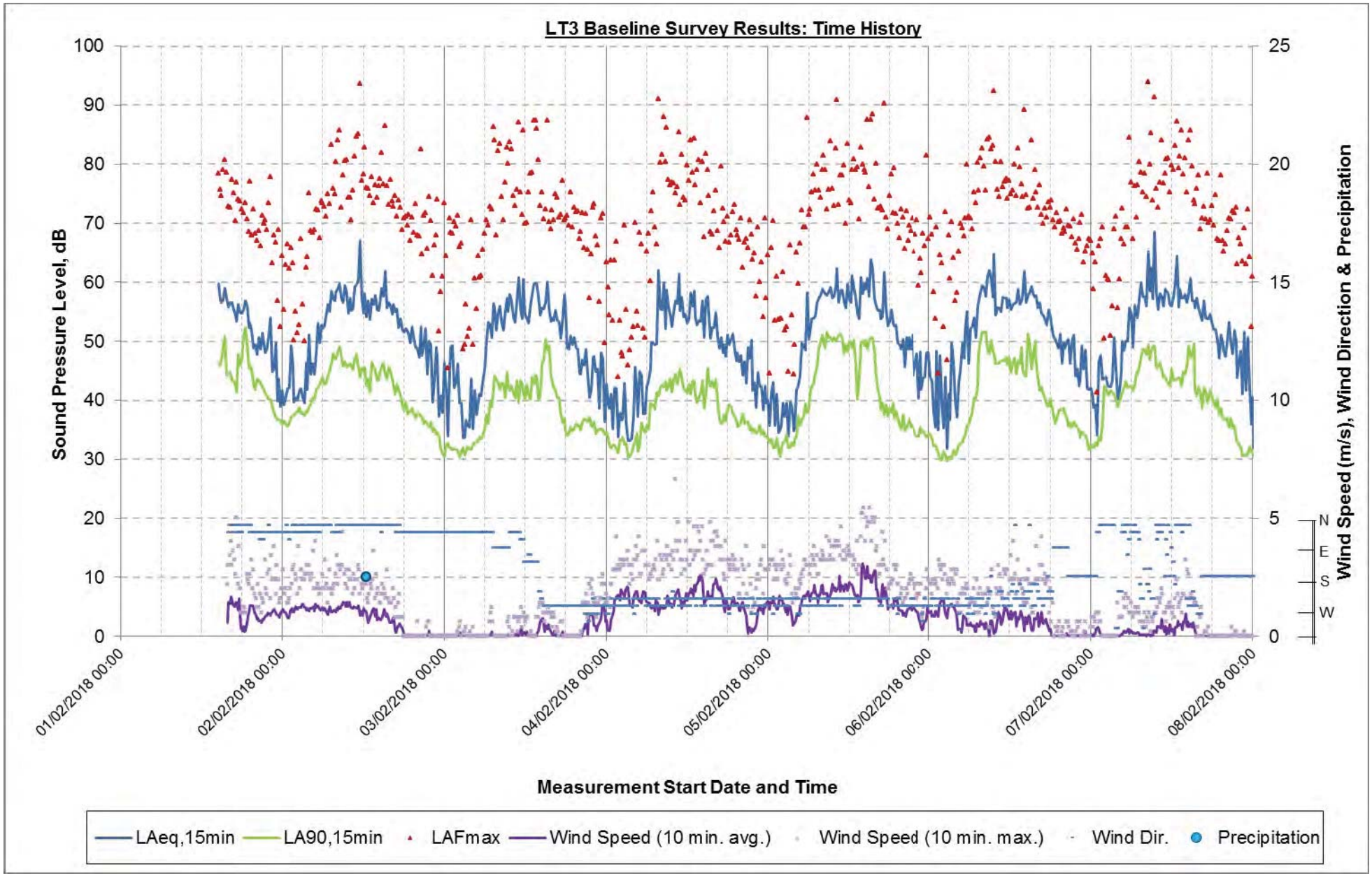

LT2 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
01/02/2018 00:00
02/02/2018 00:00
03/02/2018 00:00
04/02/2018 00:00
05/02/2018 00:00
06/02/2018 00:00
07/02/2018 00:00
08/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

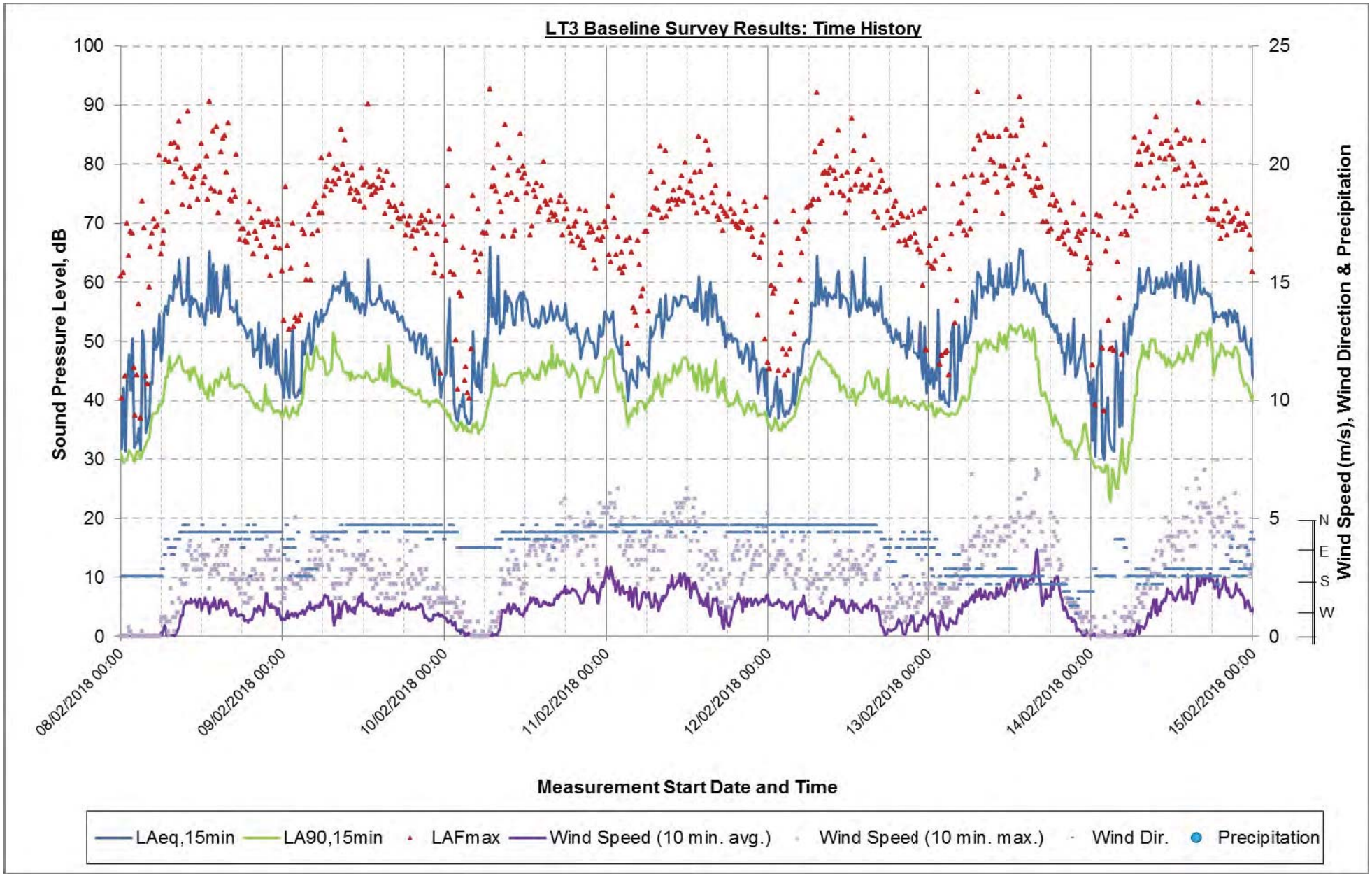

LT2 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
08/02/2018 00:00
09/02/2018 00:00
10/02/2018 00:00
11/02/2018 00:00
12/02/2018 00:00
13/02/2018 00:00
14/02/2018 00:00
15/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

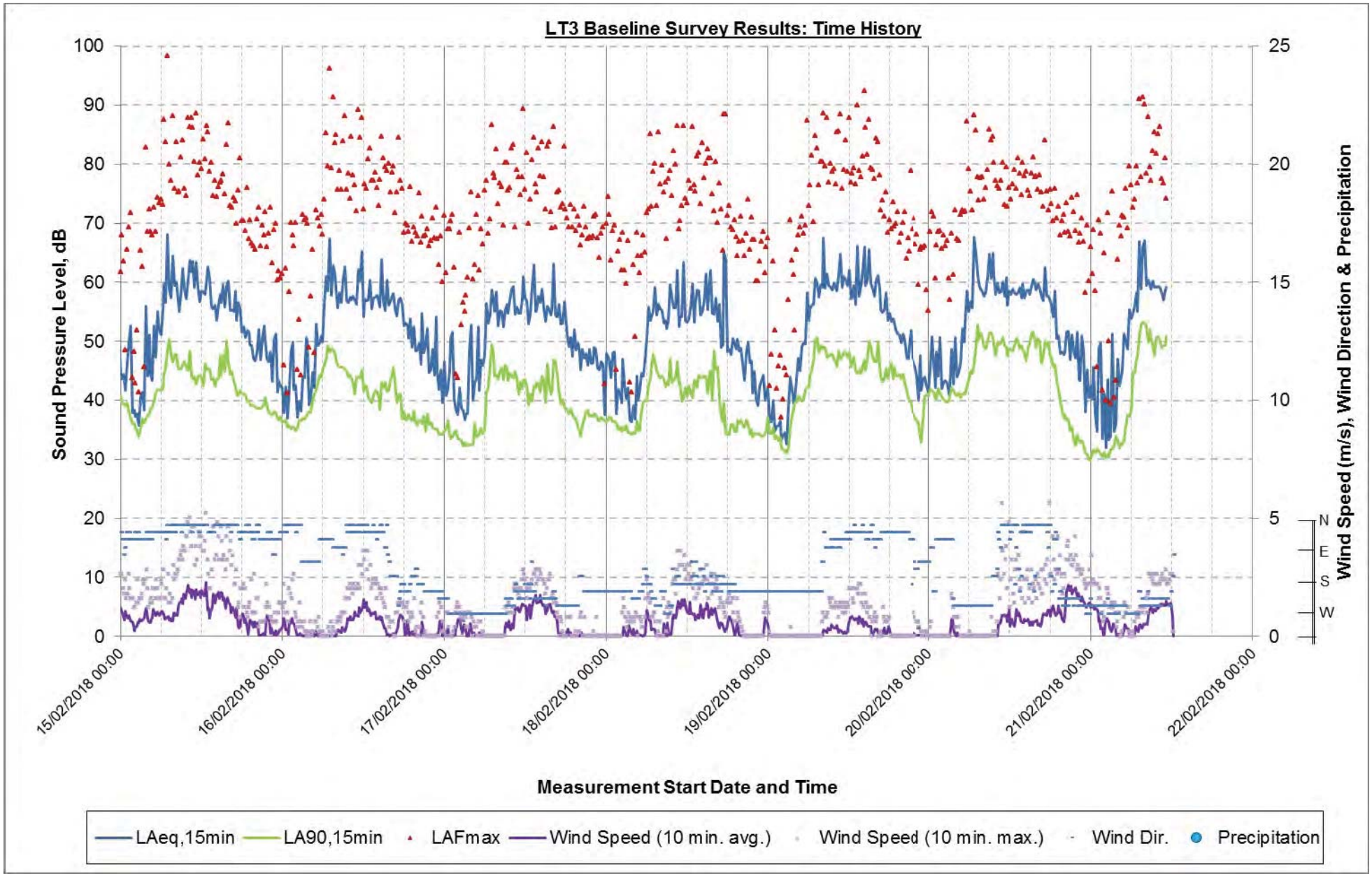

LT2 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
15/02/2018 00:00
16/02/2018 00:00
17/02/2018 00:00
18/02/2018 00:00
19/02/2018 00:00
20/02/2018 00:00
21/02/2018 00:00
22/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

LT2: Baseline Survey Results: Summary

	Residual sound, dB $L_{Aeq,T}$			Background sound, dB $L_{A90,T}$			Maximum sound, dB $L_{AFmax,T}$		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
Range	34 - 68	31 - 56	26 - 55	27 - 51	27 - 49	25 - 47	41 - 99	38 - 89	31 - 81
25th percentile	45	39	35	38	34	32	61	52	46
Median	48	42	39	42	36	35	65	57	51
75th percentile	51	45	42	45	39	38	70	61	57
Arithmetic Average	48	42	39	41	37	35	66	57	52
Standard deviation	5	4	5	5	4	4	8	6	9

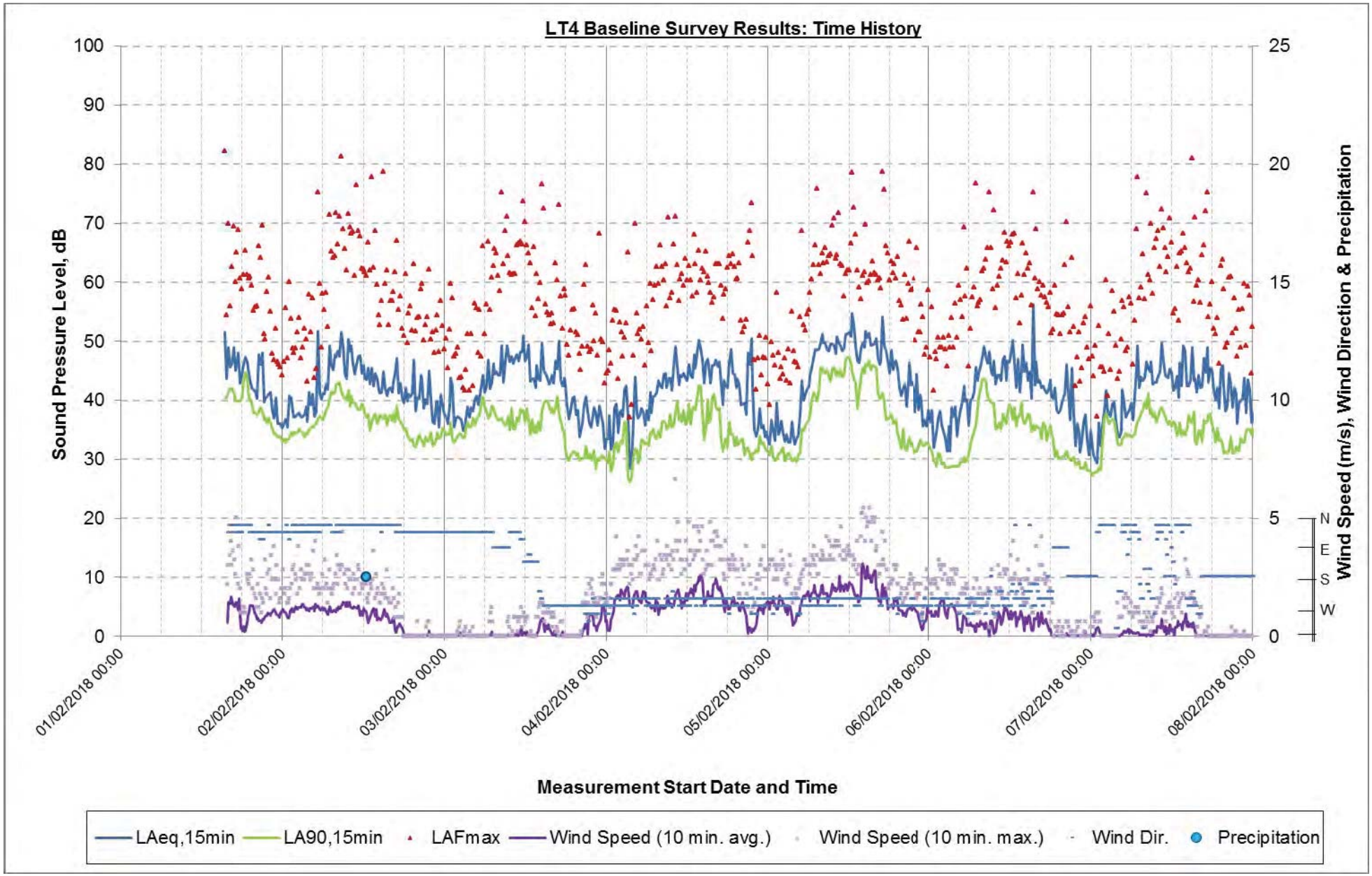

LT3 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
01/02/2018 00:00
02/02/2018 00:00
03/02/2018 00:00
04/02/2018 00:00
05/02/2018 00:00
06/02/2018 00:00
07/02/2018 00:00
08/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

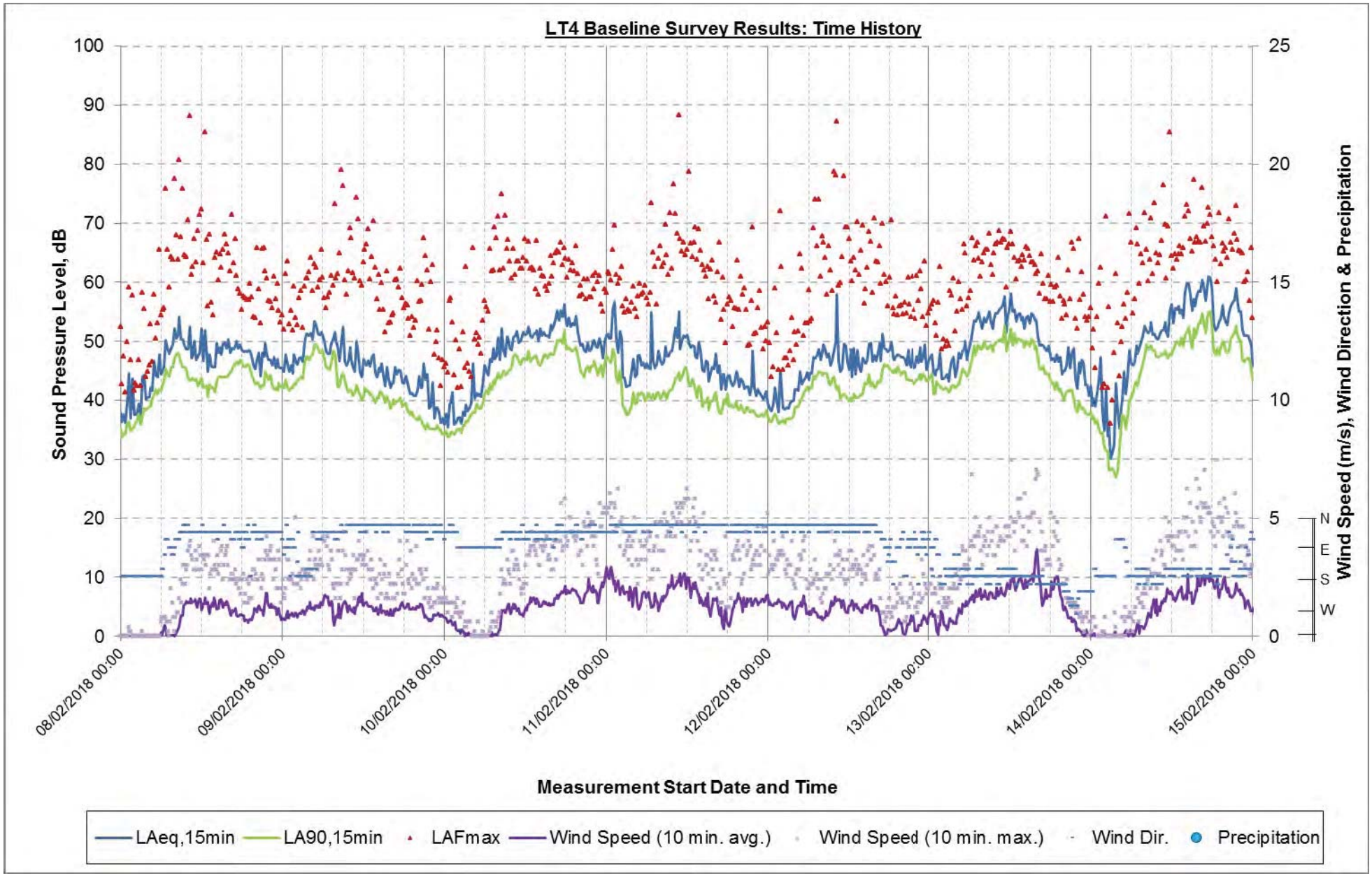

LT3 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
08/02/2018 00:00
09/02/2018 00:00
10/02/2018 00:00
11/02/2018 00:00
12/02/2018 00:00
13/02/2018 00:00
14/02/2018 00:00
15/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

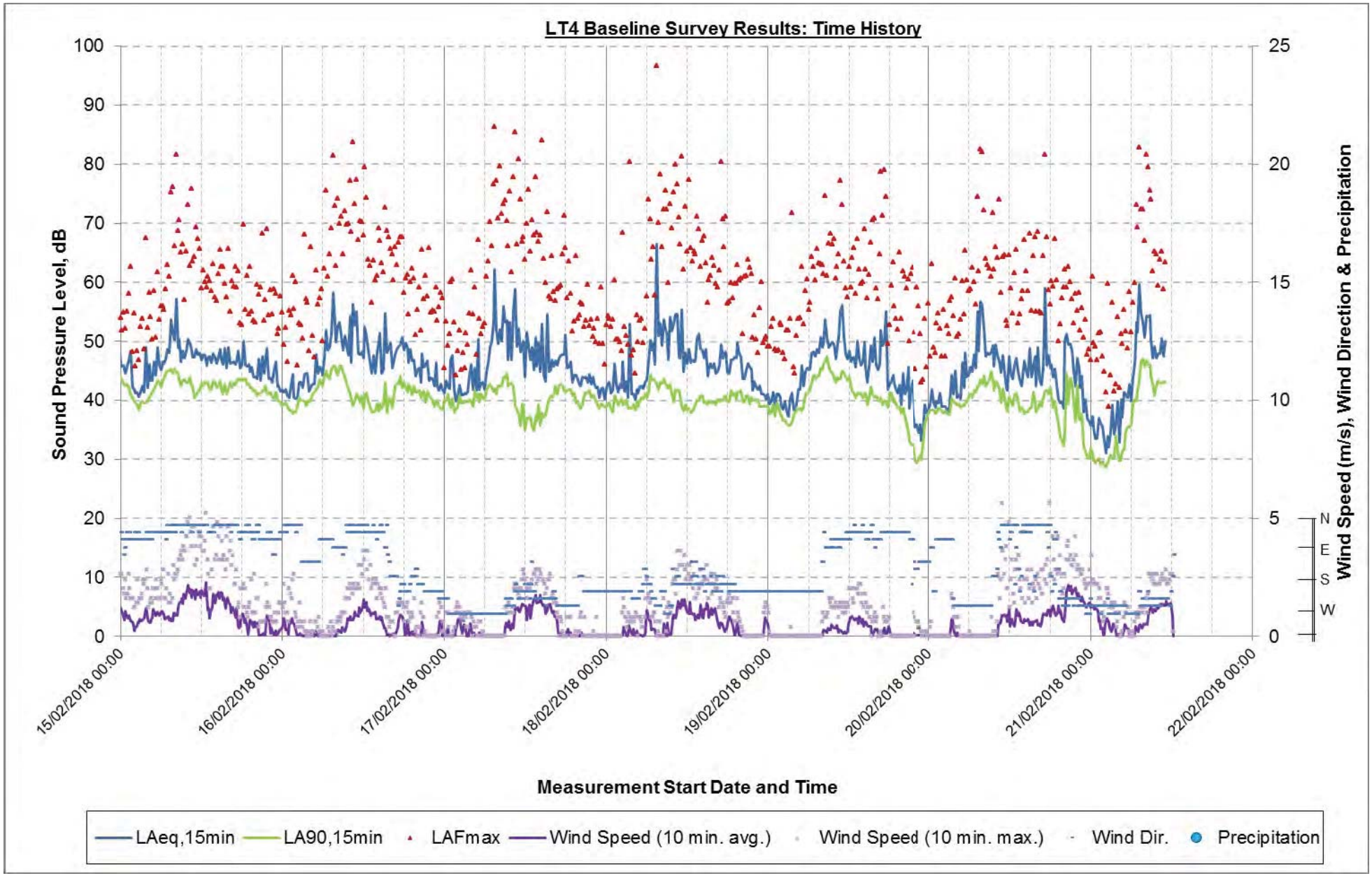

LT3 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
15/02/2018 00:00
16/02/2018 00:00
17/02/2018 00:00
18/02/2018 00:00
19/02/2018 00:00
20/02/2018 00:00
21/02/2018 00:00
22/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

LT3: Baseline Survey Results: Summary

	Residual sound, dB $L_{Aeq,T}$			Background sound, dB $L_{A90,T}$			Maximum sound, dB $L_{AFmax,T}$		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
Range	48 - 80	39 - 55	30 - 68	34 - 53	30 - 50	23 - 49	65 - 104	55 - 83	37 - 93
25th percentile	55	47	40	42	36	33	74	67	57
Median	57	49	44	45	38	37	77	69	66
75th percentile	59	51	50	48	40	40	81	71	70
Arithmetic Average	57	49	45	45	38	37	78	69	64
Standard deviation	3	3	6	4	4	5	5	3	10

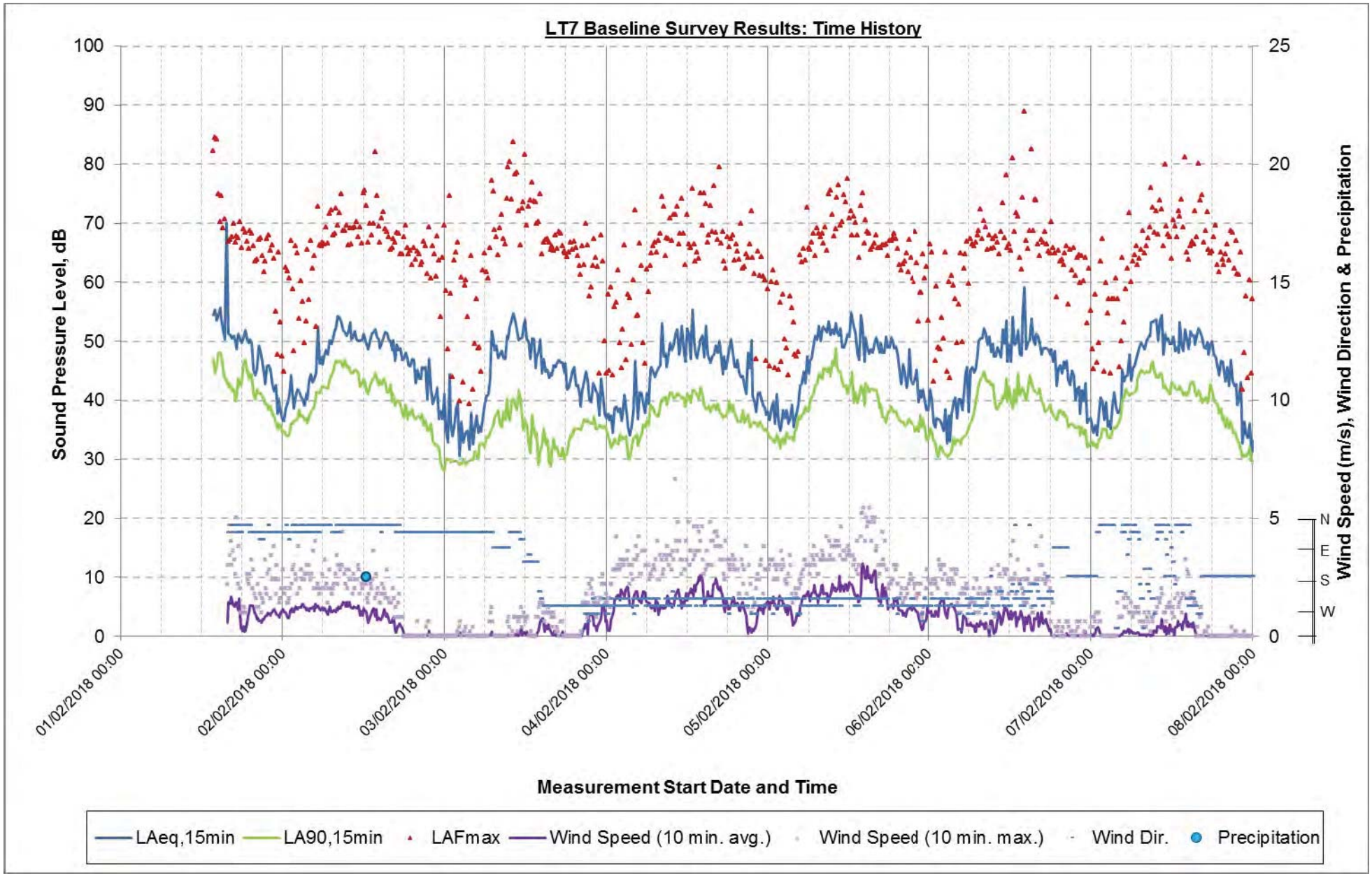

LT4 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
01/02/2018 00:00
02/02/2018 00:00
03/02/2018 00:00
04/02/2018 00:00
05/02/2018 00:00
06/02/2018 00:00
07/02/2018 00:00
08/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

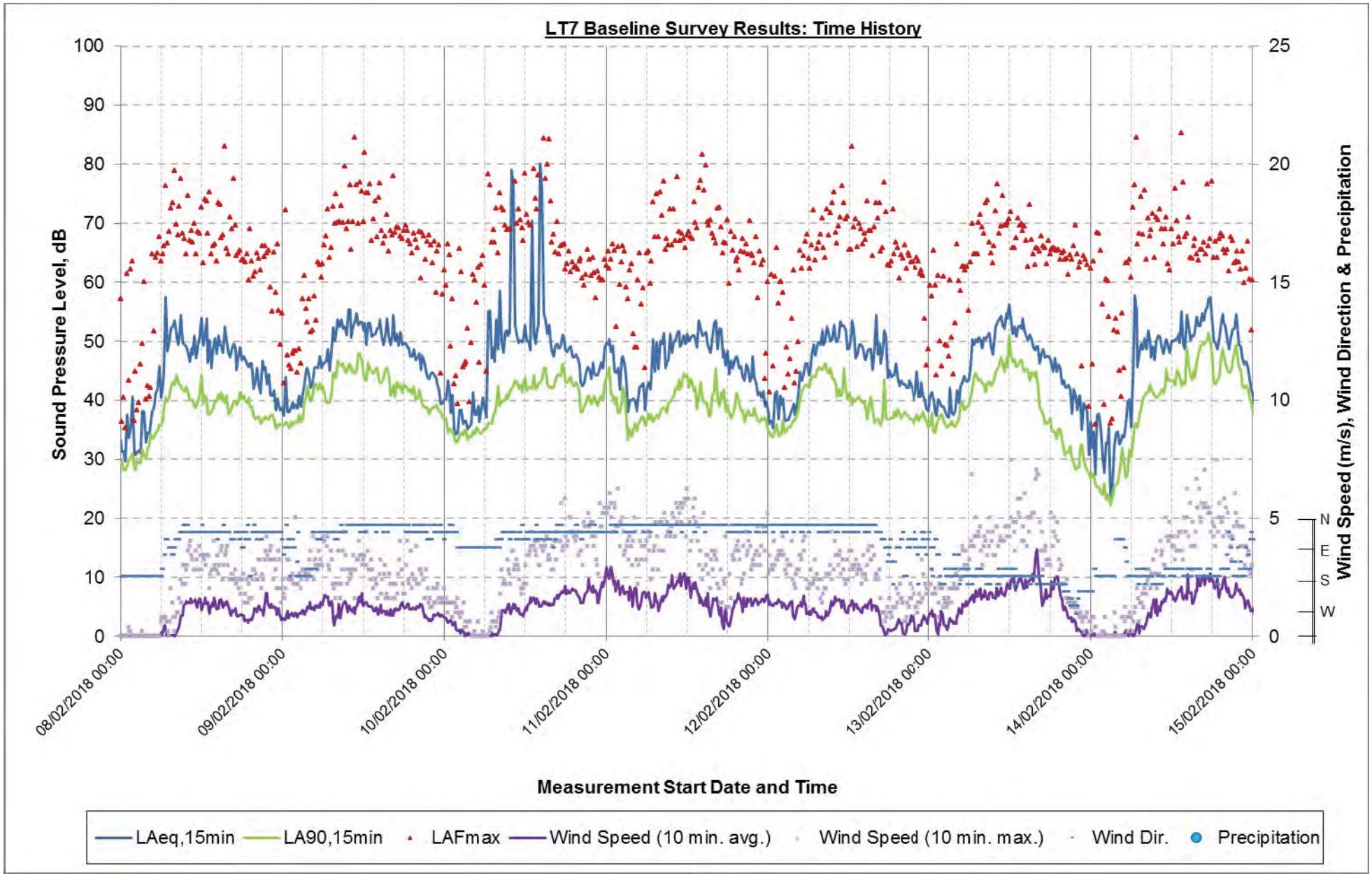

LT4 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
08/02/2018 00:00
09/02/2018 00:00
10/02/2018 00:00
11/02/2018 00:00
12/02/2018 00:00
13/02/2018 00:00
14/02/2018 00:00
15/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

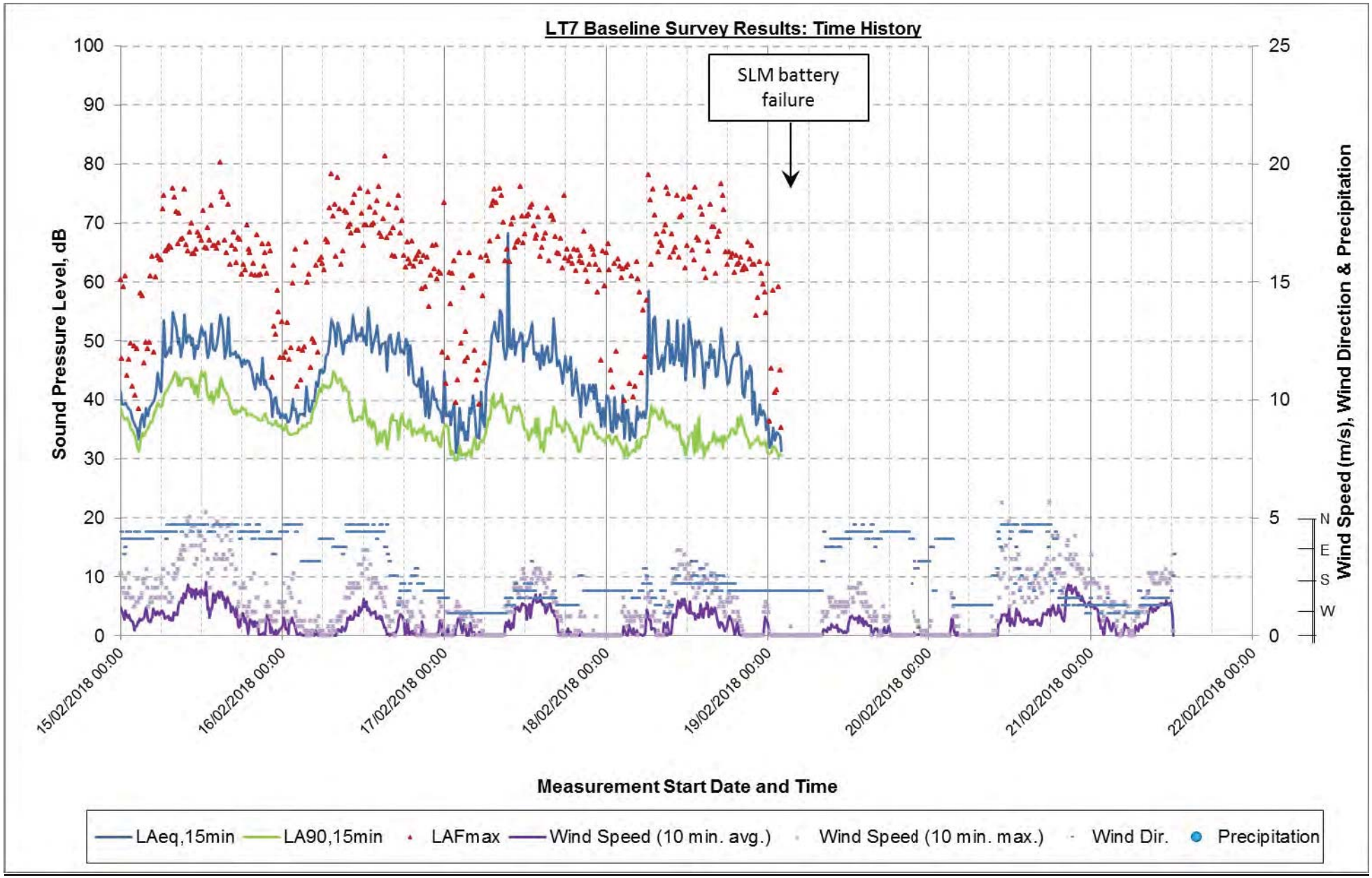

LT4 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
15/02/2018 00:00
16/02/2018 00:00
17/02/2018 00:00
18/02/2018 00:00
19/02/2018 00:00
20/02/2018 00:00
21/02/2018 00:00
22/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

LT4: Baseline Survey Results: Summary

	Residual sound, dB $L_{Aeq,T}$			Background sound, dB $L_{A90,T}$			Maximum sound, dB $L_{AFmax,T}$		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
Range	37 - 66	31 - 59	29 - 57	30 - 55	28 - 53	26 - 50	48 - 97	42 - 73	36 - 80
25th percentile	45	41	38	39	33	34	60	53	48
Median	48	44	41	41	39	38	64	57	53
75th percentile	50	47	45	44	42	41	68	61	58
Arithmetic Average	48	44	41	42	38	37	64	57	53
Standard deviation	4	5	5	4	6	5	7	6	7


LT7 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
Measurement Start Date and Time
01/02/2018 00:00
02/02/2018 00:00
03/02/2018 00:00
04/02/2018 00:00
05/02/2018 00:00
06/02/2018 00:00
07/02/2018 00:00
08/02/2018 00:00
N
E
S
W
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation


LT7 Baseline Survey Results: Time History
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
08/02/2018 00:00
09/02/2018 00:00
10/02/2018 00:00
11/02/2018 00:00
12/02/2018 00:00
13/02/2018 00:00
14/02/2018 00:00
15/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation


LT7 Baseline Survey Results: Time History
SLM battery failure
Sound Pressure Level, dB
Wind Speed (m/s), Wind Direction & Precipitation
100
90
80
70
60
50
40
30
20
10
0
25
20
15
10
5
0
N
E
S
W
15/02/2018 00:00
16/02/2018 00:00
17/02/2018 00:00
18/02/2018 00:00
19/02/2018 00:00
20/02/2018 00:00
21/02/2018 00:00
22/02/2018 00:00
Measurement Start Date and Time
LAeq,15min
LA90,15min
LAFmax
Wind Speed (10 min. avg.)
Wind Speed (10 min. max.)
Wind Dir.
Precipitation

LT7: Baseline Survey Results: Summary

	Residual sound, dB $L_{Aeq,T}$			Background sound, dB $L_{A90,T}$			Maximum sound, dB $L_{AFmax,T}$		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
Range	42 - 80	33 - 55	24 - 59	29 - 51	28 - 50	22 - 46	60 - 118	42 - 72	35 - 85
25th percentile	48	42	37	38	35	32	66	62	49
Median	50	44	39	41	37	35	69	64	59
75th percentile	51	46	42	43	38	37	72	66	64
Arithmetic Average	50	44	39	41	37	35	70	64	56
Standard deviation	3	3	5	4	3	4	6	4	9

Appendix C – Baseline Survey Results: Short Term Attended Measurements

Table C1: Short Term Attended Measurements – LT1 Byron Gardens

Start Time	Local Weather					Subjective Audibility* (0 – 4)				Sound Pressure Level, dB						Comments
	Wind Speed, ms^{-1}	Wind Direction	Temperature, °C	Humidity, %RH	Cloud, Octants	Industry	Wind in flora	Road	Other (trains/aircraft)	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A50}	L_{A90}	No. of Pauses	
01/02/2018 16:47	2	W	7	60	4	1	2	4	1	67	88	71	53	45	0	Occasional but regular traffic on adjacent on Fort Road dominant and cause of L_{Amax} levels (high % HGVs). Distant traffic audible. Distant industry audible.
01/02/2018 21:23	2	W	4	60	8	1	2	4	1	57	83	51	43	41	0	Very occasional but regular traffic on adjacent on Fort Road dominant and cause of L_{Amax} levels (high % HGVs). Distant traffic, v. distant sirens and port activity, v. occasional local traffic, fence rattling. Train @ +5mins. Distant industry.
01/02/2018 23:01	3	W	5	60	6	1	2	3	3	46	69	50	40	38	0	Distant traffic, distant reverse alarm from port, distant aircraft, 2 trains, 1 passenger 1 long freight. Distant industry.
02/02/2018 00:08	3	W	5	60	3	1	2	3	3	45	73	42	38	37	0	Occasional freight train cause of L_{Amax} levels. Distant traffic, distant aircraft. Distant industry.
02/02/2018 01:14	2	W	4	60	2	1	2	3	3	49	75	50	40	38	0	Wind, distant traffic, 2 freight trains cause of L_{Amax} levels. Distant industry.
02/02/2018 10:26	3	W	6	60	6	1	2	4	1	59	80	59	48	44	0	Occasional but regular traffic on adjacent Fort Road dominant and cause of L_{Amax} levels (high % HGVs). Wind rustle, distant aircraft, trains, local traffic, distant and local HGVs. Distant industry.
02/02/2018 11:30	3	W	6	60	7	1	2	4	1	61	81	60	47	42	0	Occasional but regular traffic on adjacent Fort Road dominant and cause of L_{Amax} levels (high % HGVs). Road traffic local and distant, greater proportion of HGVs, voices, distant industry and aircraft, birds

*Subjective Audibility:

0 = Inaudible 1 = Just audible 2=Audible 3=Significant Source 4=Dominant

General Notes:

Daytime ambient levels at LT1 were dominated by local road traffic movements on Fort Road, including a high percentage of HGVs. Night-time ambient levels were dominated by local road traffic movements and rail movements. Daytime and night-time background levels were primarily affected by distant traffic and industry. Daytime and night-time maxima affected by local road traffic and/or train movements.

Table C2: Short Term Attended Measurements – LT2 Buckland

Start Time	Local Weather					Subjective Audibility* (0 – 4)				Sound Pressure Level, dB						Comments
	Wind Speed, ms^{-1}	Wind Direction	Temperature, °C	Humidity, %RH	Cloud, Octants	Industry	Wind in flora	Road	Other (trains/aircraft)	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A50}	L_{A90}	No. of Pauses	
01/02/2018 15:43	2	W	7	60	4	2	2	4	2	52	74	56	50	45	0	Metal recycling continuous, birds, vegetation
01/02/2018 22:12	2	W	4	60	8	1	2	3	1	46	68	49	43	41	0	Distant traffic, vegetation movement
01/02/2018 23:41	3	W	5	60	5	1	2	3	1	42	65	43	40	38	0	Distant traffic, vegetation movement
02/02/2018 00:49	3	W	5	60	2	1	2	3	1	39	58	40	37	36	0	Vegetation movement
02/02/2018 02:05	3	W	3	60	2	1	2	3	1	43	63	45	42	40	0	Vegetation movement
02/02/2018 11:08	3.5	W	6	60	6	2	2	4	2	53	66	56	51	47	0	Metal recycling continuously audible, distant traffic, vegetation

*Subjective Audibility:

0 = Inaudible 1 = Just audible 2=Audible 3=Significant Source 4=Dominant

General Notes:

Daytime ambient levels at LT2 were primarily affected by local farming activity, occasional aircraft overhead and to some extent distant industry (metals recycling facility located on Station Road). Night-time ambient levels were primarily affected by distant traffic and industry. Daytime and night-time background levels were primarily affected by distant traffic and industry, and wind in flora. Daytime and night-time maxima affected by local road traffic and/or train movements.

Table C3: Short Term Attended Measurements – LT3 Walnut Tree Farm

	Local Weather					Subjective Audibility* (0 – 4)				Sound Pressure Level, dB						
Start Time	Wind Speed, ms^{-1}	Wind Direction	Temperature, °C	Humidity, %RH	Cloud, Octants	Industry	Wind in flora	Road	Other (trains/aircraft)	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A50}	L_{A90}	No. of Pauses	Comments
01/02/2018 16:34	2	W	7	60	4	2	1	4	1	56	76	60	46	41	0	Local road traffic on Church Road dominant with high % HGVs. Distant aircraft, birds. Quiet when traffic is low
01/02/2018 22:30	3	W	5	60	6	2	1	3	2	52	74	49	40	38	0	Occasional local road traffic movements (cars) on Church Road. Distant traffic, some local traffic, wind rustle, distant aircraft and industry
01/02/2018 23:21	3	W	5	60	6	1	1	3	2	52	78	41	38	37	0	Occasional local road traffic movements (cars) on Church Road. Distant traffic, v. occasional local traffic, vegetation movement. Train @ +2mins
02/02/2018 00:29	3	W	5	60	3	1	1	3	2	48	72	45	37	36	0	Occasional local road traffic movements (cars) on Church Road. Distant traffic, v. occasional local traffic, vegetation movement
02/02/2018 01:44	2	W	4	60	2	1	1	3	2	40	65	42	39	38	0	Occasional local road traffic movements (cars) on Church Road. Vegetation movement
02/02/2018 10:49	3	W	6	60	6	2	1	4	1	63	82	67	52	48	0	Local road traffic on Church Road dominant with high % HGVs. Road adjacent fairly busy, cars and HGVs. Traffic dominant

*Subjective Audibility:

0 = Inaudible 1 = Just audible 2=Audible 3=Significant Source 4=Dominant

General Notes:

Daytime ambient levels at LT3 were dominated by local road traffic movements on Church Road, including a high percentage of HGVs. Night-time ambient levels were dominated by local road traffic movements on Church Road and rail movements. Daytime and night-time background levels were primarily affected by distant traffic and industrial sources. Daytime and night-time maxima affected by local road traffic on Church Road and/or train movements.

Table C4: Short Term Attended Measurements – LT4 St James Church

Start Time	Local Weather					Subjective Audibility* (0 – 4)				Sound Pressure Level, dB						Comments
	Wind Speed, ms^{-1}	Wind Direction	Temperature, °C	Humidity, %RH	Cloud, Octants	Industry	Wind in flora	Road	Other (trains/aircraft)	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A50}	L_{A90}	No. of Pauses	
01/02/2018 16:51	3	W	5	60	7	1	2	3	1	58	78	54	46	43	0	Distant traffic and aircraft, birds, occasional local traffic on Church Road
01/02/2018 21:51	2	W	4	60	8	1	2	2	1	45	61	46	44	42	0	Distant traffic, wind rustle, dog bark
01/02/2018 23:22	3	W	5	60	5	1	2	2	1	47	72	48	40	39	0	Fox, distant traffic, wind
02/02/2018 00:29	3	W	5	60	3	1	2	2	1	42	73	41	38	37	0	Distant traffic, v. distant industry
02/02/2018 01:47	2	W	4	60	2	1	2	2	1	43	74	42	40	39	0	Wind, light distant traffic
02/02/2018 10:45	3	W	6	60	6	1	2	3	1	58	78	57	47	45	0	Wind rustle, local on Church Road and distant traffic, birds, distant aircraft
02/02/2018 11:51	3	W	6	60	7	1	2	3	1	59	77	59	48	44	0	Wind rustle, local on Church Road and distant traffic, birds, distant aircraft

Subjective Audibility:

0 = Inaudible 1 = Just audible 2=Audible 3=Significant Source 4=Dominant

General Notes:

Daytime ambient levels at LT4 were primarily affected by local road traffic movements on Church Road and occasional aircraft. Night-time ambient levels were primarily affected by local and distant road traffic movements. Daytime and night-time background levels were primarily affected by distant traffic and industrial sources, and wind in flora. Daytime and night-time maxima affected by local road traffic and/or aircraft.

Table C5: Short Term Attended Measurements – ST5 Tilbury Fort

Start Time	Local Weather					Subjective Audibility* (0 – 4)				Sound Pressure Level, dB						Comments
	Wind Speed, ms^{-1}	Wind Direction	Temperature, °C	Humidity, %RH	Cloud, Octants	Industry	Wind in flora	Road	Other (trains/aircraft)	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A50}	L_{A90}	No. of Pauses	
01/02/2018 16:23	2	W	7	60	4	2	1	2	1	52	65	54	52	50	0	Largely distant road traffic, distant aircraft, distant voices, fence rattle with wind. Train @ +13mins
01/02/2018 17:21	2	W	6	60	8	2	1	2	1	52	69	53	52	50	0	Distant traffic, distant reverse alarm, wind, water, distant aircraft, barges
02/02/2018 09:55	3	W	6	60	6	2	1	2	1	52	66	54	51	49	0	Distant traffic and aircraft, port activity: engines, clanging, alarms

Subjective Audibility:

0 = Inaudible 1 = Just audible 2=Audible 3=Significant Source 4=Dominant

General Notes:

Daytime ambient and background levels at ST5 were primarily affected by local activity, distant traffic and industry. Daytime maxima affected by local activity and/or aircraft.

Table C6: Short Term Attended Measurements – ST6 Sandhurst Road

Start Time	Local Weather					Subjective Audibility* (0 – 4)				Sound Pressure Level, dB						Comments
	Wind Speed, ms^{-1}	Wind Direction	Temperature, °C	Humidity, %RH	Cloud, Octants	Industry	Wind in flora	Road	Other (trains/aircraft)	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A50}	L_{A90}	No. of Pauses	
01/02/2018 17:10	3	W	5	60	7	2	1	4	1	50	66	53	47	45	0	Roads dominant, local and distant, distant aircraft, train @+7mins.
01/02/2018 21:44	2	W	4	60	8	2	1	4	1	50	73	51	44	43	0	Distant traffic, occasional local traffic on Sandhurst Road close to survey location and Fort Road, railway power lines humming. Train @ +2mins, +8mins.
01/02/2018 22:59	3	W	5	60	6	2	1	3	3	57	90	59	42	41	0	Distant traffic, occasional local traffic on Sandhurst Road close to survey location and Fort Road, railway power lines humming.
02/02/2018 00:06	3	W	5	60	4	2	1	2	3	41	68	42	40	39	0	Distant traffic, railway power lines humming.
02/02/2018 01:23	2	W	4	60	2	2	1	2	3	50	70	48	41	40	0	Railway power lines humming.
02/02/2018 10:26	3	W	6	60	6	2	1	4	1	53	71	55	47	45	0	Distant roads and aircraft, car idling nearby. Car alarm and train together @ +12mins.
02/02/2018 11:31	3	W	6	60	7	2	1	4	1	52	77	54	47	44	0	Distant roads and aircraft, occasional local traffic on Sandhurst Road close to survey location and Fort Road.

Subjective Audibility:

0 = Inaudible 1 = Just audible 2=Audible 3=Significant Source 4=Dominant

General Notes:

Daytime ambient levels at ST6 were dominated by local road traffic movements on Fort Road, including a high percentage of HGVs. Night-time ambient levels were dominated by local road traffic movements and rail movements. Daytime and night-time background levels were primarily affected by distant traffic and industrial sources. Daytime and night-time maxima affected by local road traffic and/or train movements.

Table C7: Short Term Attended Measurements – LT7 Goshem's Farm

Start Time	Local Weather					Subjective Audibility* (0 – 4)				Sound Pressure Level, dB						Comments
	Wind Speed, ms^{-1}	Wind Direction	Temperature, °C	Humidity, %RH	Cloud, Octants	Industry	Wind in flora	Road	Other (trains/aircraft)	L_{Aeq}	L_{AFmax}	L_{A10}	L_{A50}	L_{A90}	No. of Pauses	
01/02/2018 16:14	2	W	7	60	4	2	2	3	2	51	68	54	47	43	0	Metal recycling audible, local traffic, distant aircraft, birds
01/02/2018 22:10	2	W	4	60	8	1	2	2	2	50	76	48	40	38	0	Distant traffic, wind, distant industry (not metal recycling)
01/02/2018 23:44	3	W	5	60	4	1	2	2	2	44	73	45	40	37	0	Distant traffic, wind, distant industry(not metal recycling)
02/02/2018 00:52	2	W	4	60	2	1	2	2	2	39	65	40	36	34	0	Distant traffic, wind, distant industry (not metal recycling), distant train
02/02/2018 02:07	3	W	3	60	2	1	2	2	2	43	69	45	40	37	0	Distant traffic and industry (not metal recycling), wind
02/02/2018 11:07	3.5	W	6	60	6	2	2	3	2	60	83	57	48	44	0	Local traffic on Station Road (cause of L_{Amax} levels) and metal recycling: metal clanging, reverse alarm. Distant traffic and aircraft, birds, trains
02/02/2018 12:11	3	W	6	60	8	2	2	3	2	62	84	60	48	44	0	Local traffic on Station Road (cause of L_{Amax} levels) and metal recycling: metal clanging, reverse alarm. Distant traffic and aircraft, birds, trains

Subjective Audibility:

0 = Inaudible 1 = Just audible 2=Audible 3=Significant Source 4=Dominant

General Notes:

Daytime ambient levels at ST6 were primarily affected by local road traffic movements on Station Road, local commercial activity (vehicle service centre), and to some extent distant industry (metals recycling facility located on Station Road). Night-time ambient levels were dominated by local road traffic movements and rail movements. Daytime and night-time background levels were primarily affected by distant traffic and industrial sources, and wind in flora. Daytime and night-time maxima affected by local road traffic movements.

References

1 British Standards Institution. British Standard 4142:2014. Methods for rating and assessing industrial and commercial sound.

2 British Standards Institution. British Standard 7445-2:1991 Description and measurement of environmental noise - Part 2: Guide to the acquisition of data pertinent to land use.

RPS

Contact

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Appendix F: Environmental Consultation Records

Natural England

From: Bustard, Jonathan (NE) <[redacted]>
Sent: 04 July 2018 17:22
To: Matthew Fasham <[redacted]>; Andrew Troup <atroup@stateraenergy.co.uk>
Cc: Mike Barker (Cambridge) <[redacted]>; Tom Dearing <[redacted]>
Subject: RE: Tilbury Peaking Plant - commons advice?

Dear Matt

Thank you for the summary of the conversation, which is a helpful note.

A few contextual points for reference. When you have more details around mitigation options for licensable species, we will be pleased to review these under DAS, as far as we are able within a reasonable timeframe. For other species groups, we are selective on what we engage with, so I should advise you that we are unlikely to cover the whole scope of ecology in a SoCG. We are, as you know, particularly interested in the invertebrates, and I note your CPA report, which I am sure will be helpful. I added on the phone that whilst foraging enhancements are welcome, given the interest in the area, it is also nesting opportunities for bees which will utilise otherwise rank tussocky grassland for this purpose – this value is often overlooked for grassland where local context is all important (and no more so than in the Tilbury NSIP cluster). The proximity of mitigation land for this purpose to the donor site is something to consider (i.e. could it sustain this function for those species located in the Tilbury power station complex?).

In addition, we made passing reference to the “common land” status of the site, and your provision of alternative land. As mentioned, I have made contact with our commons specialist, Nicola Harper, as Natural England has a role in providing advice on commons. We would like to extend our DAS offer to commons for your project, and when you feel in a position to do so, to provide pre-application advice on compliance with relevant legislation etc. Would you be interested in this, and if so, do you have an idea when this may be required, so I can secure staff time this end?

We look forward to hearing from you in due course, as required.

Kind regards,
Jonathan

Jonathan Bustard
Casework Manager
West Anglia & Norfolk / Suffolk
Natural England

01206 382751 / [redacted]

E-mail is our preferred method of communication. If absolutely necessary, any postal correspondence should be addressed for my attention to Natural England Mail Hub, County Hall, Spetchley Road, Worcester WR5 2NP

www.gov.uk/natural-england

We are here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

In an effort to reduce Natural England's carbon footprint, I will, wherever possible, avoid travelling to meetings and attend via audio, video or web conferencing.

From: Matthew Fasham [redacted]]
Sent: 22 June 2018 16:41
To: Bustard, Jonathan (NE) [redacted]>
Cc: Mike Barker (Cambridge) [redacted]; Tom Dearing [redacted]
Subject: RE: Tilbury Peaking Plant

Jonathan

One further point I should have mentioned, is that the aim of this consultation is in part so that we can hopefully produce a statement of common ground on ecology that deals with the majority if not all of the impacts from the project prior to the examination process. This is obviously some way off but is worth keeping in mind as we continue our discussions.

Regards

Matt

From: Matthew Fasham
Sent: 22 June 2018 14:34
To: 'Bustard, Jonathan (NE)' [redacted]
Cc: Mike Barker (Cambridge) [redacted]; Tom Dearing

[redacted]
Subject: RE: Tilbury Peaking Plant

Jonathan

Further to our phone call this morning, below is a summary of the key points of discussion.

We have now more or less finished the programme of survey work (there are a couple of reptile surveys remaining but other than that everything is finished. We will be writing up a survey report over the next couple of weeks, which I'll forward on when complete. A brief summary of the survey is as follows:

Survey area: We have covered a wider survey area than just the fields proposed for the peaking plant itself, to ensure that additional land for e.g. habitat creation, access roads, gas connection etc has been covered. Results are therefore summarised for the whole survey area not just the Main Site.

Botanical survey: we have confirmed that the common land grassland is slightly better quality than previously identified – likely to be poor semi-improved / semi-improved neutral grassland rather than improved. We have collected species frequency data from grasslands across the site to use as a baseline for habitat creation seedmixes.

Invertebrates: Colin Plant Associates were engaged to undertake an invertebrate scoping survey of the main site. Their conclusion was that there was no requirement to undertake additional detailed invertebrate surveys of this site. Recommendations were made for replacement meadow planting to provide nectar sources for bees.

- Reptiles: Adder, slow worm, grass snake and common lizard have been recorded over the site, including on the Main Site. Habitat creation and translocation of reptiles will therefore be required.

- GCN: An eDNA test of the pond west of the main site returned a negative result. We are undertaking further eDNA samples of ditches adjacent to the main site and another pond north of the railway line, results yet to be received.

Breeding birds: A reasonable farmland bird assemblage has been recorded across the wider survey area, including 5 cetti's warbler breeding territories around. Several BoCC red listed species have been recorded breeding on the site including yellowhammer, skylark, linnet and starling, also several amber listed species have been recorded including dunnock, reed bunting and kestrel.

Water Voles: Presence of water voles has been noted in ditches within and on the boundary of the main site. The ditch across the main site (separating the common land from the arable land) will need to be removed, and therefore a water vole licence will be required. Mitigation is likely to comprise improvement of existing ditches and potentially creation of additional ditches.

Badgers: Some latrines and runs have been noted but no setts have been found.

Mitigation: Our outline mitigation proposals will accompany the survey report. We are proposing use of an existing arable field north of the railway line and adjacent to common land, to provide a minimum of equal area of common land lost. Habitat creation will comprise creation of meadow grassland, with additional features such as scrub planting, log / rubble piles, varied microtopography (hummocks / hollows), south facing banks, and potentially a new pond and ditch creation – the intention is for this area to provide mitigation for all species above and to enhance existing common land by providing a larger contiguous area of grassland than is currently the case.

There should also be opportunities to retain and enhance main site boundary ditch / hedges, and for some biodiversity gains in the form of surface water attenuation ponds associated with the peaking plant itself.

Overall then we do not anticipate significant issues with on site ecology given the proposed mitigation strategy. I note your comment regarding the scrutiny of adjacent projects from NGOs such as Buglife, and our proposals do take into account recommendations made by a specialist invertebrate consultant.

Air quality

-

In terms of potential effects that require HRA screening / scoping, my view is that air quality is the only potential impact – we are sufficiently distant from the SPA that surface water and disturbance impacts are not likely. Air quality modelling is being undertaken. Not all of the SPA features are susceptible to AQ impacts but I think that cumulative effects with the other proposed projects (Tilbury 2, the Thames crossing, RWE) is likely to be where the focus is. We would like to consult further on HRA screening and AQ impacts once the assessment is further advanced.

Project programme: I hope to be attending a meeting with Andrew next week at which point I may be able to give further details on the likely timescale for submission of the application. I note your comments regarding resourcing on Natural England's side, and we will bear in mind that your workload is such that rapid turnaround of comments is not likely to be possible.

I think this covers the substantive points of discussion, but if you have anything to add to the above, please let me know.

Regards

Matt

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From: Matthew Fasham
Sent: 15 June 2018 10:29
To: 'Bustard, Jonathan (NE)' [redacted]
Subject: RE: Tilbury Peaking Plant

Jonathan

Next week will be fine. What I might do is email you over a short summary of where we are with the surveys in advance of that.

The HRA case law Andrew was referring to was the Wealden judgment about assessing cumulative effects on European sites from air quality, specifically in that instance on the assessment of local plans that had individually insignificant AQ impacts from traffic generation but collectively significant ones. There has also been the recent judgment that has established that mitigation measures that are not key components of a project cannot be used to screen out likely significant impacts, but I don't think that should have implications for this site. But we can discuss in more detail next week.

Regards

Matt

From: Bustard, Jonathan (NE) [redacted]
Sent: 15 June 2018 10:20
To: Matthew Fasham <[redacted]>
Subject: [EXT] RE: Tilbury Peaking Plant

Hello Matt

Thanks for your email. Things are very busy for me at the moment, but the end of next week is looking better.

Can we say Friday morning say 09:30?

Andrew mentioned an interesting piece of EIA case law had been passed recently. Would be useful to understand the details.

Thanks, Jonathan

Jonathan Bustard
Casework Manager
West Anglia & Norfolk / Suffolk

Natural England

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E-mail is our preferred method of communication. If absolutely necessary, any postal correspondence should be addressed for my attention to Natural England Mail Hub, County Hall, Spetchley Road, Worcester WR5 2NP

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We are here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

In an effort to reduce Natural England's carbon footprint, I will, wherever possible, avoid travelling to meetings and attend via audio, video or web conferencing.

From: Matthew Fasham [redacted]
Sent: 08 June 2018 16:17
To: Bustard, Jonathan (NE) [redacted]
Subject: RE: Tilbury Peaking Plant

Jonathan

Andrew Troup has asked me to give you a quick call next week to discuss progress on the ecological surveys at Tilbury. Are there any days / times in particular that would suit you?

Regards

Matt

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From: Bustard, Jonathan (NE) [redacted]
Sent: 29 March 2018 21:47

To: Matthew Fasham [redacted]
Cc: Mike Barker (Cambridge) [redacted]; Melvin, Jamie (NE) [redacted]
Subject: [EXT] RE: Tilbury Peaking Plant

Dear Matthew

Thank you for your email setting out your proposals below.

Unfortunately despite considerable efforts I have been unable to respond to your survey proposals in the time available, before my annual leave.

I would like to provide some more detailed contextual comments as discussed on site at the earlier meeting, but very briefly regard your proposals for initial survey work to be broadly acceptable. On the invert side, yes an initial scoping exercise would be appropriate, noting the proximity of invert interest of national significance on the adjacent power station site & surrounds (much detail of which is in the public domain already).

I will aim to provide some more detailed comments as indicated in due course, but I hope this enables you to make some progress in the interim.

Kind regards,
Jonathan

Jonathan Bustard
Casework Manager
West Anglia & Norfolk / Suffolk
Natural England

01206 382751 / [redacted]

E-mail is our preferred method of communication. If absolutely necessary, any postal correspondence should be addressed for my attention to Natural England Mail Hub, County Hall, Spetchley Road, Worcester WR5 2NP

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From: Matthew Fasham [redacted]
Sent: 12 March 2018 14:21
To: Bustard, Jonathan (NE) [redacted]
Cc: Mike Barker (Cambridge) [redacted]
Subject: RE: Tilbury Peaking Plant

Jonathan

Many thanks for getting back to me. I appreciate that this is a busy period for you so I thought I would set out our initial thoughts on scoping for surveys etc. Obviously we need to get these under way soon, so while it would be very useful to have a call later in the month as you've suggested, if you have time to respond to this via email before then, that would assist us in drawing up the survey programme.

I've attached the meeting minutes we've received. As you can see they're quite sparse, so in particular we wanted to check whether you had anything in mind for invertebrates.

The DAS notes state that "a specialist entomologist should be employed to survey the site for important invert communities." Are there any particular groups of invertebrates that are considered likely to be present? We don't think that a full suite of invertebrate surveys will be required, but we were thinking that ground beetles and possibly hymenoptera communities of interest could be present in the common land, and the ditches could provide habitat for aquatic species of interest, such as odonata.

Our initial thought was therefore to engage a specialist to undertake a scoping site visit and make recommendations for further surveys if considered necessary.

The DAS notes also recommended surveys for raptors. We would propose to undertake breeding bird surveys (territory mapping) to assess the site's value for birds. If there are any particular raptor species that you're aware of in the area, it would be useful to know. Our view is that Barn Owl could be present in the general area, and possibly harriers.

Our initial thoughts on surveys that will be carried out are therefore:

- Phase 1 habitat survey of the additional land within the redline but outside the main proposed construction site
- Further botanical survey of the common land (mainly to flesh out and more accurately locate the plant species list from the preliminary survey, to inform habitat creation measures)
- Invertebrates: An initial scoping assessment, to be followed up with sampling surveys of particular groups if recommended by the specialist
- Reptiles (in areas of suitable habitat within land selected for common land transfer, if suitable habitat exists): standard 7-visit refugia surveys
- GCN (again, if suitable waterbodies are present), to be surveyed via eDNA (with PSCA surveys if any are found)
- Breeding birds (5 visits March – mid May to conduct territory mapping)
- Water Voles (single visit to inspect ditches)
- Badgers (to update existing survey information and to extend out to cover additional land)

As per the conclusions of the Cherryfield Ecology PEA, we don't consider that bat surveys are likely to be required, given the lack of roosting opportunities. There will undoubtedly be some bat foraging but the proposals allow for retention / reinforcement of boundary features and therefore the ability of bats to disperse across the landscape would not be affected.

In terms of other impacts that would be assessed at the ES / HRA screening stage, we would carry out an assessment of potential air quality impacts on statutory designated sites up to 10 km from the proposals. The operation of the development does not involve any aqueous discharge, so water quality effects on designated sites would be scoped out of the assessment.

If you're able to give us your initial thoughts on the above, that would be greatly appreciated.

Regards

Matt

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From: Bustard, Jonathan (NE) [redacted]
Sent: 09 March 2018 17:30
To: Matthew Fasham [redacted]
Cc: Mike Barker (Cambridge) [redacted]
Subject: [EXT] RE: Tilbury Peaking Plant

Dear Matt

Thanks for the voicemail, and follow-up email. Things are exceptionally busy for me at the moment, so I have to look for the most efficient approach to supporting this project. I had wondered that it had gone a bit quiet since the site meeting, so your news makes sense. I think for the time being, if you could let me know any specific pressing questions, that would be helpful (even sight of the notes would be useful – I've not seen them). Then perhaps we can have a fuller conversation later in the month (w/c 26th March is probably the earlier I'm afraid). I hope this timescale is convenient for you.

Kind regards, Jonathan

Jonathan Bustard
Casework Manager
West Anglia & Norfolk / Suffolk
Natural England

01206 382751 / [redacted]

E-mail is our preferred method of communication. If absolutely necessary, any postal correspondence should be addressed for my attention to Natural England Mail Hub, County Hall, Spetchley Road, Worcester WR5 2NP

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From: Matthew Fasham [redacted]
Sent: 09 March 2018 12:32
To: Bustard, Jonathan (NE) <[redacted]
Cc: Mike Barker (Cambridge) [redacted]>
Subject: Tilbury Peaking Plant

Jonathan

RPS are taking on the ecology element of the Stratera Energy Tilbury Peaking Plant application which you've been dealing with via DAS.

We've received some notes on your recent meeting but they're quite light on detail, so I was hoping to speak to you regarding scoping the ecology surveys. Are you available for a quick call next week?

Regards

Matt

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Thurrock Council EHO (noise)

From: Gentry, Mark
To: [redacted]
Cc: [redacted]
Subject: [EXT] RE: 9473t: Tilbury - Consultation Regarding Proposed Baseline Monitoring Plan
Date: 18 January 2018 16:41:39
Attachments: [redacted]

Good afternoon Patrick,

I can confirm your proposal for baseline noise measurements are fine.

You may be aware of the adjacent Tilbury 2 Port application ES that was submitted to PINS before Christmas.
Some of their receptors are close to those you are proposing, and the ES documentation may, or may not, assist you.
For the avoidance of doubt, I am not suggesting you need to carry out your assessment in-combination with Tilbury 2.
If you do need to look at the ES documentation it can be found here:

https://infrastructure.planninginspectorate.gov.uk/projects/south-east/tilbury2/?ipcsection=docs

I hope that assists you.

Kind regards

Mark Gentry I Environmental Health Officer
Planning, Transportation & Public Protection Department I Place Directorate
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Thurrock Council, Civic Offices, New Road, Grays, Essex RM17 6SL
Thurrock: A place of opportunity, enterprise and excellence, where individuals, communities and businesses flourish

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From: Patrick Hoyle [mailto:[redacted]
Sent: 18 January 2018 12:32
To: Gentry, Mark
Cc: Simon Stephenson
Subject: 9473t: Tilbury - Consultation Regarding Proposed Baseline Monitoring Plan

Dear Mark

I was passed your contact details by one of your colleagues in the pollution control department.

I'm an acoustic consultant for RPS who has been commissioned by our client to provide a noise assessment for a proposed development at Tilbury.

I'm writing to you to seek your agreement on the scope of the baseline surveys that will inform the noise assessment. Subject to weather conditions we may be looking to commence the site work next week so I would be most grateful if you could review the attached monitoring plan and provide any comments you may have on the scope of the baseline monitoring required to inform the assessment.

If you have any comments on the attached, or would like to talk about any points arising following review of the plan, I would be happy to discuss these with you – my contact details are provided below.

However I am out of the office this afternoon and on Friday, returning Monday next week. In my absence my Director, Simon Stephenson (cc'd), should be available to discuss any matters arising.

I look forward to hearing from you.

Best regards
Patrick

Patrick Hoyle BSc(Hons) MIOA
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Appendix G: Baseline Air Quality Monitoring Report

Introduction

Nitrogen dioxide (NO_2) concentrations in ambient air were monitored around the proposed development in Thurrock over a six-month period between December 2017 and June 2018. The results are presented in this appendix.

Methodology

Diffusion tube samplers for NO_2 were deployed in duplicate at five locations around the proposed development site in Tilbury. The locations are illustrated in Figure 1. All diffusion tubes were fixed to suitable street furniture at heights of approximately 2 metres above the ground, and were exposed over nominally monthly time periods. The exposed tubes were analysed by our approved sub-contract laboratory (Gradko), which holds UKAS accreditation for this analysis. The results from the six monitoring periods are discussed in this appendix.

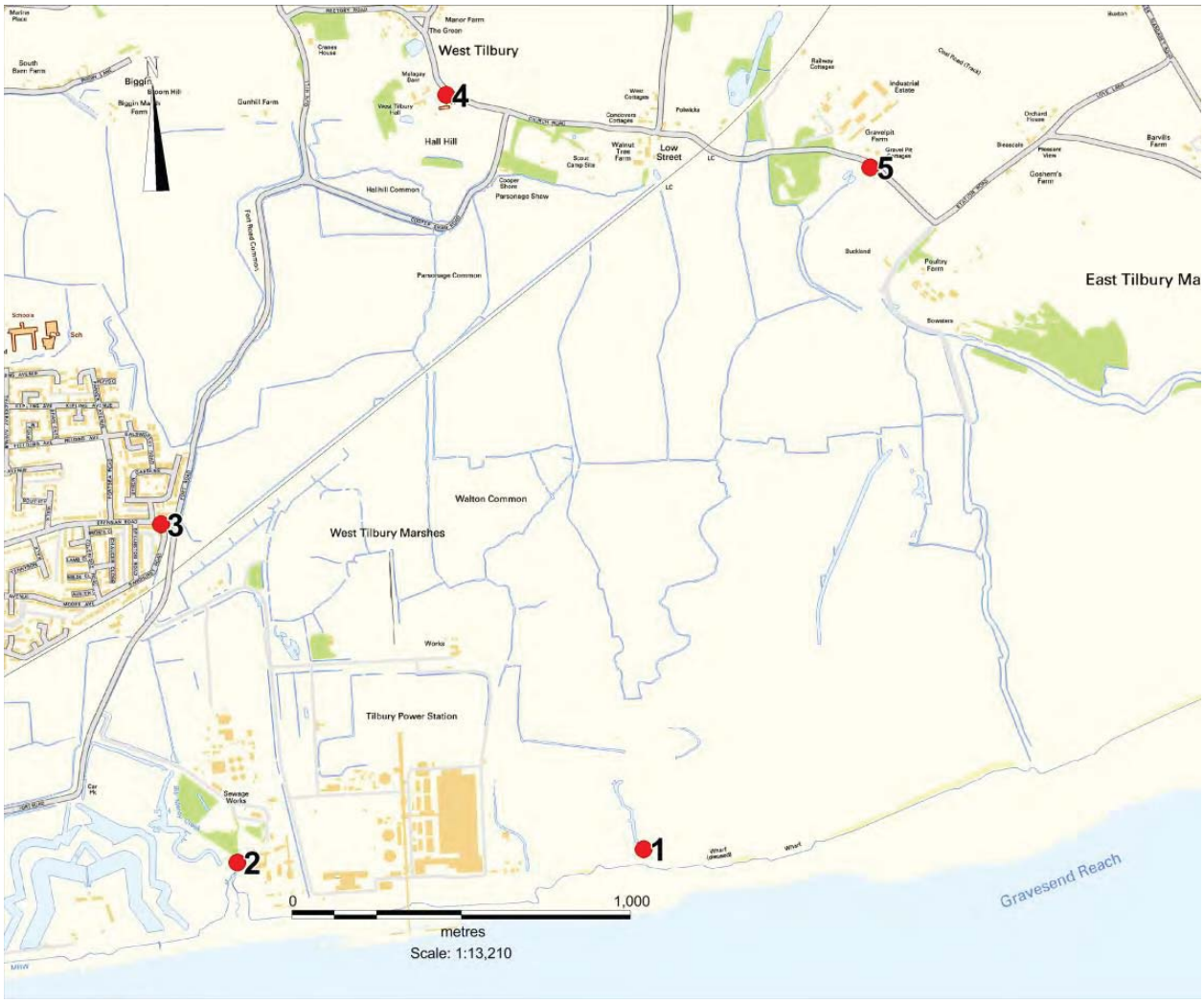


Figure 1: Map of NO_2 Monitoring Locations

At each location, the mean was calculated of the five concentration results obtained over successive four-week periods between 12th December 2017 and 18th June 2018. This "period-mean" was then annualised in accordance with the method set out in LAQM.TG16. This adjustment provides an estimate of what the annual mean concentration is expected to be at each monitoring location had monitoring been carried out for a full year. This annualisation calculation involves obtaining the full, measured annual-mean NO_2 concentrations and the period-mean concentrations for the same study period from two background automatic monitoring stations (Thurrock and London Bexley). At each of these reference monitoring stations, the ratio between the annual mean and the period mean NO_2 concentration was determined and an overall annualisation factor was calculated.

The diffusion tube data were also corrected for bias using Defra's most recent national bias adjustment factor spreadsheet in accordance with good practice.

Results and discussion

The resulting annual-mean NO_2 concentrations, adjusted for bias, are summarised in Table 1.

Table 1: Annual-Mean NO_2 Concentrations ($\mu g.m^{-3}$) Adjusted for Bias

Monitoring Location	Monitored Annual Mean ($\mu g.m^{-3}$)
1	21.2
2	19.5
3	26.4
4	18.3
5	18.0
Maximum	**26.4**
Minimum	**18.0**

The background concentration in the vicinity of the proposed development was assessed previously in a site-specific diffusion tube monitoring survey, the data from which are given in an appendix for an environmental statement chapter (Appendix 18.B, Table 18.25) for a proposed port terminal at the former Tilbury Power Station (Tilbury2), which was published by the Port of Tilbury in November 2017. Those concentrations ranged from 24.7 to 38.6 $\mu g.m^{-3}$. As can be seen from Table 1 above, the estimates of annual-mean concentrations obtained from this monitoring study range from 18.0 to 26.4 $\mu g.m^{-3}$. These estimates are generally lower than the range of concentrations that were previously used to characterise background NO_2 in the vicinity of the proposed development.