



Request for an EIA Scoping Opinion

Britannia Refined Metals Wind Energy

Britannia Refined Metals

Botany Road, Northfleet, Gravesend, Kent, DA11 9BG

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Basis of Report

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Acronyms and Abbreviations

Abbreviation	Definition
AGL	Above Ground Level
AIL	Abnormal Indivisible Load
ALRA	Abnormal Load Route Assessment
AONB	Area of Outstanding Natural Beauty (also called National Landscapes)
AQMA	Air Quality Management Area
ATC	Automatic Traffic Count
BGS	British Geological Survey
BRM	Britannia Refined Metals (Applicant)
CAA	Civil Aviation Authority
CEMP	Construction Environmental Management Plan
CR	Collision Risk
DAS	Design and Access Statement
EA	Environment Agency
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
ES	Environmental Statement
FRA	Flood Risk Assessment
GBC	Gravesham Borough Council
GIS	Geographic Information Systems
HDV	Heavy Duty Vehicle
HE	Historic England
HEDBA	Historic Environment Desk Based Assessment
HGV	Heavy Goods Vehicle
HRA	Habitat Regulations Assessment
ICAO	International Civil Aviation Organisation
IEF	Important Ecological Feature
KCC	Kent County Council
kV	Kilovolt
LCA	Landscape Character Area
LCRM	Land Contamination Risk Management
LI	Landscape Institute
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LPA	Local Planning Authority
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation



Abbreviation	Definition
MW	Megawatt
NATS	National Air Traffic Services Limited
NE	Natural England
nm	Nautical Mile
NPPF	National Planning Policy Framework
NS	NatureScot
NSR	Noise Sensitive Receptor
OFCOM	Office of Communications
OS	Ordnance Survey
PEA	Preliminary Ecological Appraisal
PLA	Port of London Authority
PLQRA	Preliminary Land Quality Risk Assessment
POC	Point of Connection
PPG	Planning Practice Guidance
PRF	Potential Roost Feature (for bats)
RMC	Ready Mixed Concrete
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SO	Special Order
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
STGO	Special Types General Order
SuDS	Sustainable Drainage System
TA	Transport Assessment
UKPN	UK Power Networks
VP	Viewpoint (landscape and visual assessment), and Vantage Point (ornithology)
WHS	World Heritage Site
ZTV	Zone of Theoretical Visibility



1.0 Introduction

SLR Consulting Ltd has been commissioned by Britannia Refined Metals ('BRM' - the 'Applicant') to prepare this Request for an Environmental Impact Assessment (EIA) Scoping Opinion from Gravesham Borough Council (GBC) in relation to proposals for a wind-energy development comprising three wind turbines of up to 140 metre tip height above foundations and associated infrastructure (referred to as the Proposed Development), on land at its existing operational facility on Botany Way, Northfleet, Kent (the Site). The location of the Proposed Development is shown on **Figure 1.1**.

To provide transparency in relation to the Proposed Development, the Applicant has determined that an EIA should be undertaken to inform and support the detailed planning application required for consent. This report represents the first formal stage of the EIA process. The applicable legislation is the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations') and this makes provision for an Applicant to seek a formal opinion from the determining authority, in this case GBC, on the content of the EIA and resulting Environmental Statement (ES).

This request for an EIA Scoping Opinion has been submitted by the Applicant in accordance with Regulation 15 of the EIA Regulations and the principal objective of Scoping is to determine the likely significant effects associated with the Proposed Development and the scope of assessments that should be included within the EIA. The EIA Planning Practice Guidance (March 2014, as amended May 2020) notes in paragraph 035 Reference ID: 4-035-20170728 that:

"Whilst every Environmental Statement should provide a full factual description of the development, the emphasis of Schedule 4 is on the "main" or "significant" environmental effects to which a development is likely to give rise. The Environmental Statement should be proportionate and not be any longer than is necessary to assess properly those effects. Where for example only one environmental factor is likely to be significantly affected the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate their possible relevance has been considered."

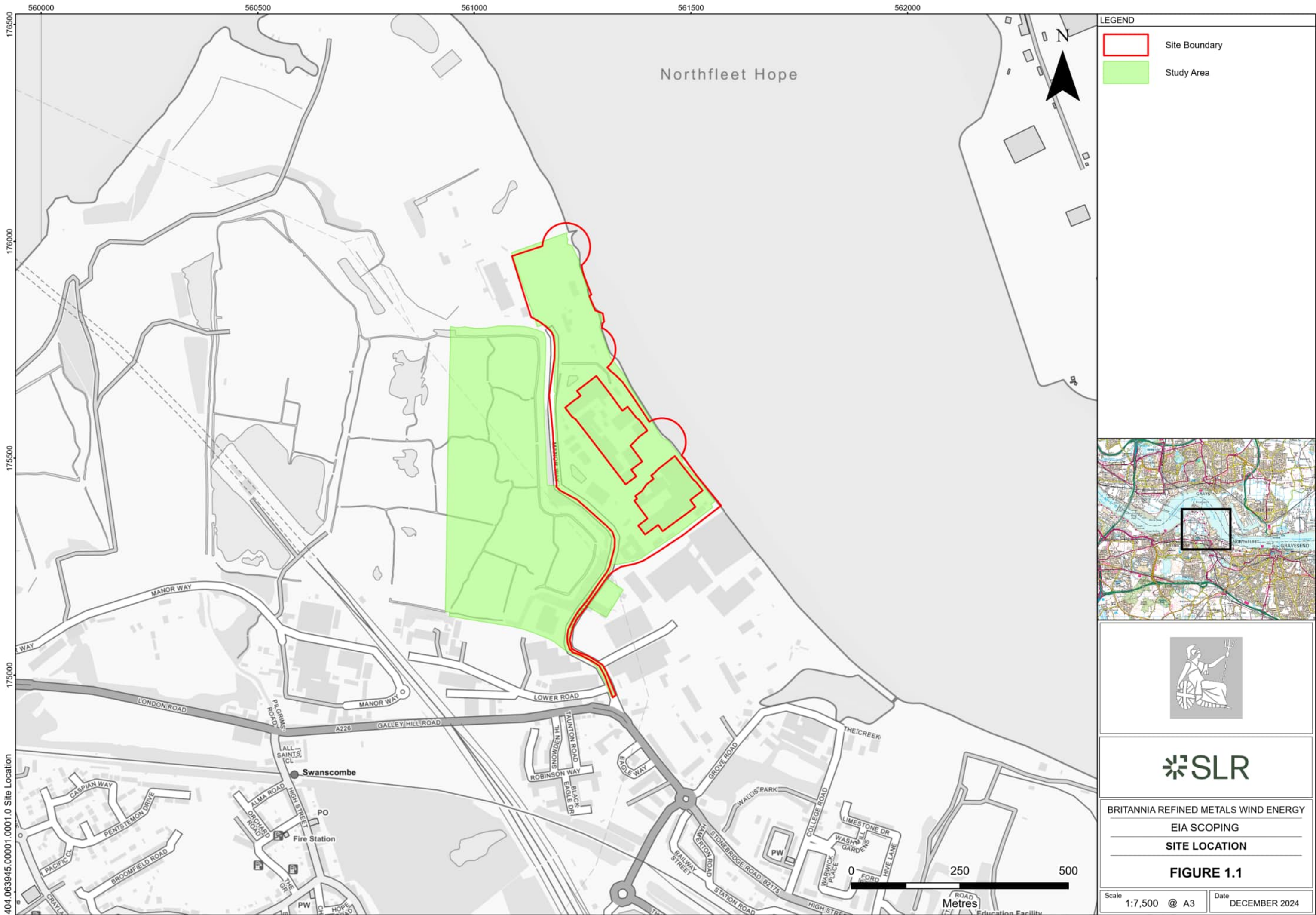
Where an EIA Scoping Opinion is provided, the ES must be based on that Opinion (Regulation 18(4a)). In the preparation of this report, it has been assumed that the EIA will be undertaken in accordance with the requirements of the EIA Regulations, which have informed this report, along with the prevailing EIA Planning Practice Guidance. In accordance with Regulation 15(2a) of the EIA Regulations, the following information is provided within this report:

- *A plan sufficient to identify the land;*
- *A brief description of the nature and purpose of the development including its location and technical capacity;*
- *An explanation of the likely significant effects of the development on the environment;*
- *Such other information or representations that the person making the request may wish to provide or make.*

The EIA Regulations require that GBC consults on the proposed scope of the EIA with statutory consultation bodies as a minimum and any other bodies that it considers necessary. Responses gathered during the statutory five-week consultation period will be reviewed by GBC, prior to issue of its formal Scoping Opinion.

The structure of this Scoping Opinion Request is set out in **Table 1-1**.





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BRITANNIA REFINED METALS WIND ENERGY
EIA SCOPING
SITE LOCATION

FIGURE 1.1

Scale 1:7,500 @ A3 Date DECEMBER 2024

Table 1-1: Structure of the Scoping Opinion Request

Section	Information included
2	Description of the Site and its surroundings
3	Description of the Proposed Development
4	Summarises the approach to EIA Scoping
5	Describes the overarching approach to the assessment of impact significance in the ES
6 to 13	Describes the relevant environmental impact topic areas and whether these are proposed within the EIA scope. Where a topic is proposed within the EIA scope, the proposed assessment methodology is provided
14	Summarises the proposed structure of the ES



2.0 Site description

The Site is shown and edged in red on **Figure 1.1** and the Study Area for baseline field surveys is shown shaded in green. The Study Area represents land within the ownership or control of the Applicant that has been considered for the Proposed Development from the concept stage, and over which baseline assessments have been undertaken to inform the selection of the proposed wind turbine locations. Further information about the design evolution of the Proposed Development is provided within Chapter 3.0 of this report.

2.1 Description of the Site

The Site is located on the BRM estate to the west of the Thames Estuary approximately 3.5 kilometres (2.2 miles) northwest of the town of Gravesend (**Figures 2.1 and 2.2**). Key features described within this section are shown on **Figure 2.3**. The Site lies within the administrative boundary of GBC and is located in the *Northfleet Embankment and Swanscombe Peninsula East Opportunity Area* and the *Swanscombe Peninsula East Riverside Industrial Area*. The boundary with Dartford Borough Council (DBC) is approximately 250 metres to the southwest.

The majority of the Site comprises previously developed land that is in operational industrial and commercial use by BRM. Founded in 1930, BRM is one of the largest lead producers in the world, as well as a world-class precious metals refinery. The wider BRM plant within the Site presently employs 150 people. The principal manufacturing units at the Site are a metal refinery and silver plant; it is equipped with its own analytical laboratories, workshops, administrative offices, stores, and engineering departments.

The northern section of the Site includes hard surfacing currently leased for open surface storage of building products. Vehicular access to this section of the Site is via the northern end of Manor Way. BRM has discussed the principle of the Proposed Development with the lessee of this area of the Site.

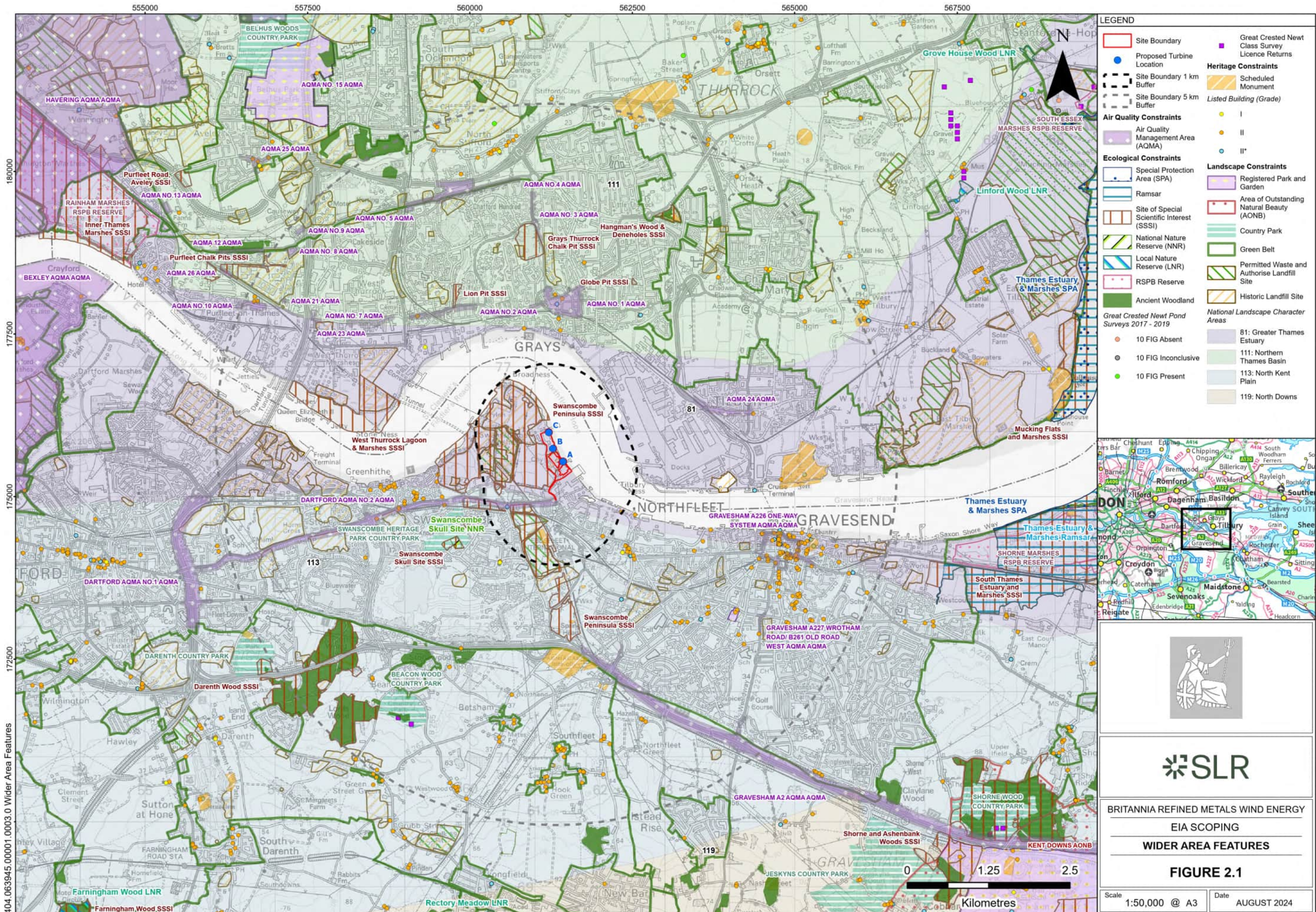
Part of the central section of the Site is currently being redeveloped under planning permission [KCC/GR/0050/2023](#) for use as a 25,000 tonnes per annum facility to sample waste electronics material such as circuit boards and copper bearing materials (referred to as 'E-Scrap'). The consented E-Scrap development on the central section of the Site includes a principal new steel-framed single-storey building, with associated yard areas and perimeter roadway. There will be vehicular entrances at the northern and southern end of the central section of the Site from Manor Way. On the eastern side of the current river wall is a linear operational wharf of approximately 20 metres in width, parallel to the estuary edge, which is accessed through a gate in the flood wall from the central section of the BRM site. The wharf is one of the safeguarded wharves along the Thames Estuary identified within the Safeguarded Wharves Review 2018-2019 undertaken by the Greater London Authority, and supported by the Port of London Authority.

Small sections of the easternmost part of the Site comprise foreshore that is exposed at low tide. The foreshore area is in third-party ownership and whilst it is not envisaged that there will be any requirement for built development or wind turbine infrastructure in these areas, they are included within the Site boundary because the proposed wind turbine blades would over sail them when operating in some wind directions.

Between the central and southern sections of the Site is an open vegetated drainage channel approximately west to east from Manor Way to the estuary; this discharges water to the estuary via a penstock valve.

The southern section of the Site is within the main area of BRM operational buildings and hardstanding used for the temporary storage of materials. Whilst the majority of the southern section of the Site comprises industrial/commercial buildings and the main BRM stack there are areas of grassed greenspace and two lagoons along its western side.





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Site Boundary

Proposed Turbine Location

Site Boundary 1 km Buffer

Site Boundary 5 km Buffer

Air Quality Constraints

Air Quality Management Area (AQMA)

Ecological Constraints

Special Protection Area (SPA)

Ramsar

Site of Special Scientific Interest (SSSI)

National Nature Reserve (NNR)

Local Nature Reserve (LNR)

RSPB Reserve

Ancient Woodland

Great Crested Newt Pond Surveys 2017 - 2019

10 FIG Absent

10 FIG Inconclusive

10 FIG Present

Great Crested Newt Class Survey Licence Returns

Heritage Constraints

Scheduled Monument

Listed Building (Grade)

I

II

II*

Landscape Constraints

Registered Park and Garden

Area of Outstanding Natural Beauty (AONB)

Country Park

Green Belt

Permitted Waste and Authorised Landfill Site

Historic Landfill Site

National Landscape Character Areas

81: Greater Thames Estuary

111: Northern Thames Basin

113: North Kent Plain

119: North Downs



BRITANNIA REFINED METALS WIND ENERGY

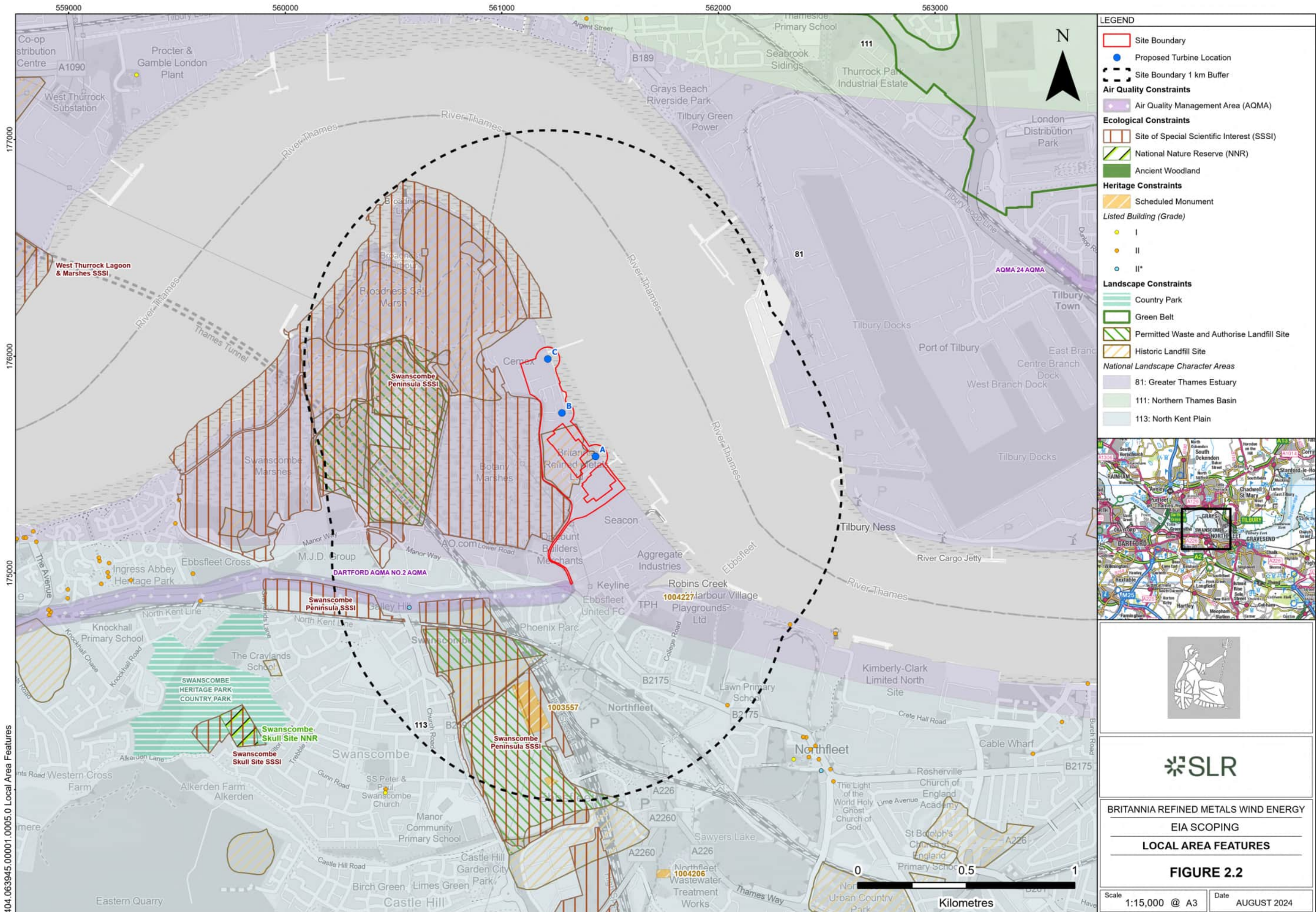
EIA SCOPING

WIDER AREA FEATURES

FIGURE 2.1

Scale 1:50,000 @ A3

Date AUGUST 2024





LEGEND

- Site Boundary
- Central Section of Site
- Northern Section of Site
- Southern Section of Site



BRITANNIA REFINED METALS WIND ENERGY

EIA SCOPING

**KEY FEATURES ON AND
ADJACENT TO THE SITE**

FIGURE 2.3

Scale	1:5,000 @ A3	Date	AUGUST 2024
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404.063945.00001.0014.0 Key Features On and Adjacent to Site

In addition to the main BRM stack, there are a number of smaller stacks within this section of the Site. The southern section of the Site is accessed via the main BRM site entrance from Manor Way, which runs along the western side of the Site in a north-south direction. Manor Way, in turn, connects to Lower Road to the south, which then joins the A226 and provides access to the wider road network.

Levels across the Site vary from approximately 4.8 metres Above Ordnance Datum (AOD) at the northern end to approximately 5.5 metres AOD at the southern end of the BRM operational area.

The England Coast Path National Trail follows Manor Way / Lower Road and then continues north and west around the Swanscombe Peninsula.

There are no statutory protected environmental designations within the Site. The majority of the Site is within Flood Zone 3 with small areas in Flood Zone 2, and although not fully reflected on the Flood Map for Planning¹, the Site is protected by the Thames Flood Wall. Wind Energy development is classed as 'Essential Infrastructure' under Annex 3 to the National Planning Policy Framework (2024) (NPPF) and as such is compatible with Flood Zones 2 and 3.

The chalk bedrock geology on the Site is classified by the British Geological Survey (BGS) and Environment Agency (EA) as a Principal Aquifer with medium vulnerability, and superficial drift geology is classified as Secondary (undifferentiated) Aquifer. A previous ground investigation undertaken as part of the E-Scrap planning application on the central section of the Site (WSP, 2023) reported that the chalk bedrock is within the West Kent Darent and Cray Chalk Groundwater Body, which was classified as being of poor overall status in 2015. The previous site-specific assessment suggested that the chalk may be in continuity with overlying secondary aquifers, tidal areas and saline marshes, all of which may influence groundwater quality. The local commercial and industrial land uses were also referenced as potential influences on groundwater quality. The northern and central sections of the Site are within the total catchment (Zone III) of a Source Protection Zone (SPZ) and the southernmost part of the Site is within the Zone II (Outer Protection) of the SPZ.

The previous ground investigation undertaken on the central section of the Site (WSP, 2023) confirmed that this area is underlain by Made Ground expected to be up to 3 metres thick, which was imported during the 1970s to build up ground levels. Underlying the Made Ground the site investigation confirmed approximately 15 to 20 metres of alluvium; 2 to 6 metres of Boyn Hill Gravels; and an upper level of chalk at approximately 21.5 metres below ground level. Depth of chalk extends to over 100 metres thick. Known ground conditions context and potential for contamination from the previous ground investigation is provided within Chapter 9 of this Scoping Opinion Request.

2.2 Description of the land immediately surrounding the Site

Land adjacent to the Site on its western side is within BRM ownership and is referred to as Botany Marshes East. This is an area of predominantly mixed grassland, scrub and reedbed habitat with ditches that forms one unit of the Swanscombe Peninsula Site of Special Scientific Interest (SSSI). This land is also part of the Botany Marshes Local Wildlife Site (LWS).

The SSSI covers a much wider area of the Swanscombe Peninsula to the north, west and southwest of the Site, totalling over 259 hectares. The SSSI was notified in March 2021 as being of special interest for the following nationally important features:

¹ <https://flood-map-for-planning.service.gov.uk/>



- Quaternary geology at Bakers Hole, a key Pleistocene site with a complex sequence of periglacial and temperate climate deposits and Middle Palaeolithic archaeology;
- populations of the plants divided sedge *Carex divisa*, yellow vetchling *Lathyrus aphaca*, slender hare's-ear *Bupleurum tenuissimum*, Bithynian vetch *Vicia bithynica* and round-leaved wintergreen *Pyrola rotundifolia* subsp. *maritima*;
- assemblages of invertebrates associated with bare sand and chalk, open short swards, open water on disturbed mineral sediments and saltmarsh and transitional brackish marsh; and
- two diverse assemblages of breeding birds, one associated with lowland open waters and their margins, lowland fen and lowland damp grassland, the other with lowland scrub.

There is public pedestrian access to Botany Marshes East via entry points along Manor Way and this part of the SSSI is crossed by a 400 kV overhead National Grid electricity line. This line runs approximately northwest to southeast on steel lattice pylons, one of which is located within Botany Marshes East. A second pylon is located adjacent to the southern boundary of the Site, on the eastern side of Manor Way/Lower Road.

Land immediately to the north of the Site is in commercial use for the processing and storage of aggregates. This current aggregate land use also includes a jetty of approximately 230 metres in length into the adjacent estuary, which has a conveyor for the transfer of aggregates.

The Thames Estuary is immediately east of the Site and there is a foreshore area adjacent to the Site of between approximately 25 metres and 60 metres in width at low tide. Adjacent to the Site, the estuary is approximately 900 metres wide. Land use on the opposite side of the estuary to the Site comprises the London Container Terminal, which is part of the Port of Tilbury. There are four operational wind turbines within the Port of Tilbury; these are 126.5 metres in height and are located along the estuary edge at between approximately 1.2 and 2.7 kilometres (0.75 and 1.7 miles) east of the Site.

Land to the immediate south of the Site comprises the Seacon Terminals Limited port facility, which includes a covered berth for all-weather working and a riverside deep-water berth. This land is operated and leased by Seacon Terminals and is within the wider BRM estate.

2.3 Description of the wider environment

The wider environment for the Site is characterised by a mix of commercial and industrial land uses to the south and southwest; the open habitats of the Swanscombe Peninsula SSSI to the west and northwest; the major land uses in this part of the Thames Estuary including the Port of Tilbury (approximately 1 kilometre (0.6 miles) east) and the Queen Elizabeth II bridge (approximately 4 kilometres (2.5 miles) west); and the settlement areas of Swanscombe (approximately 1.5 kilometres (0.9 miles) southwest), Northfleet (approximately 2.2 kilometres (1.4 miles) southeast) and Gravesend (approximately 3.5 kilometres (2.2 miles) southeast).

Figures 2.1 and 2.2 show that the closest European or International nature conservation designation to the Site is the Thames Estuary and Marshes Ramsar Site, which is approximately 6.2 kilometres (3.8 miles) to the east. The Ramsar Site is predominantly contiguous with the Thames Estuary and Marshes Special Protection Area (SPA), but their western extents are slightly different, and SPA is approximately 6.9 kilometres (4.3 miles) to the east of the Site. Both the Ramsar and SPA designations are focussed on ornithological interest.

Additional SSSIs within 5 kilometres (3.1 miles) of the Site include:



- Swanscombe Skull Site SSSI approximately 2 kilometres (1.25 miles) to the southwest;
- Darenth Wood SSSI approximately 4 kilometres (2.5 miles) to the southwest;
- West Thurrock Lagoon and Marshes SSSI approximately 2.5 kilometres (1.6 miles) to the northwest;
- Purfleet Chalk Pits SSSI approximately 5.5 kilometres (3.4 miles) to the northwest;
- Lion Pit SSSI approximately 2.6 kilometres (1.6 miles) to the northwest;
- Gray's Thurrock Chalk Pit SSSI approximately 2.8 kilometres (1.75 miles) to the north;
- Globe Pit SSSI approximately 2.8 kilometres (1.75 miles) to the northeast; and
- Hangman's Wood and Deneholes SSSI approximately 3.8 kilometres (2.4 miles) to the northeast.

The section of the Thames Estuary to the northwest of the Site is designated as the Swanscombe Marine Conservation Zone (MCZ). This area abuts the western side of the Swanscombe Peninsula and includes the full width of the estuary. It is approximately 750 metres from the Site at its closest point.

The closest National Landscape (formerly Area of Outstanding Natural Beauty) is the Kent Downs, which is approximately 8.3 kilometres (5.2 miles) to the southeast, at its closest point.

The closest Scheduled Monument to the Site is Aspdin's Kiln, which is situated within an area of warehousing approximately 700 metres to the southeast. The monument includes a mid-19th century downdraught kiln that was part of a much larger 19th century cement works which extended along the south bank of the River Thames. The Palaeolithic Sites near Baker's Hole are also a Scheduled Monument approximately 1.1 kilometres (0.7 miles) to the south of the Site but there is no summary available information for this Monument on the official list entry. Tilbury Fort is a Scheduled Monument approximately 3.5 kilometres (2.2 miles) east of the Site, which includes a Grade II* listed Officer's Mess.

The closest Conservation Area to the Site within Gravesham Borough is The Hill, Northfleet, which is approximately 1.6 kilometres (1 mile) to the southeast. The closest Conservation Area within Dartford Borough is Greenhithe, which is approximately 2.5 kilometres (1.6 miles) to the west.

With respect to highway major highway connections, the A2 runs east to west at an approximate distance of 3 kilometres (1.9 miles) south of the Site and this corridor connects to the M25 approximately 6.5 kilometres (4 miles) to the west of the Site.

In addition to these major transport corridors, the Site lies within an urban context including major residential, commercial and industrial land uses. Current active Air Quality Management Areas (AQMA's) within 5 kilometres (3.1 miles) of the Site include:

- A2 Trunk Road AQMA;
- Gravesham A226 One Way System AQMA;
- Gravesham A227 Wrotham Road/B261 Old Road West AQMA;
- Dartford AQMA No.1 AQMA;
- Dartford AQMA No.2 AQMA;
- Dartford AQMA No.4 AQMA; and
- Thurrock AQMA.



To the south of the Site, an outline planning application (20221064) has been submitted to GBC for a mixed-use redevelopment known as Northfleet Harbourside. This application received resolution to grant planning permission in April 2024 for a residential-led development including relocation of the Ebbsfleet United football ground and associated changes to the highway network. The issue of its planning permission is understood to be awaiting completion of an Appropriate Assessment under the Habitats Regulations, completion of a Section 106 legal agreement, and referral to the Secretary of State. If implemented, the Northfleet Harbourside development would alter the future local baseline for some aspects over the period of its implementation.



3.0 The Proposed Development

3.1 Introduction

BRM, in the UK, is the largest primary lead producer in Europe, producing primary lead from Mount Isa. Lead is used in many industries including renewables, automotive, electronics and aerospace.

The processing of metal is an energy-intensive process and at present largely reliant on heat and power from the national grid in the form of gas and electricity. This affects BRM in terms of energy market cost volatility but also its climate change commitments to de-carbonise and support the global transition to a low-carbon economy.

In response to the above BRM has undertaken extensive research to determine the most effective way to decarbonise its operations at the facility; particularly electricity demand.

Through specialist engagement and a detailed optioneering exercise looking at various low-carbon technologies, it has been determined that wind turbines represent the most feasible and viable solution to meet BRM's full electricity demands and make the greatest contribution to de-carbonising the facility. Roof-mounted solar photovoltaic (PV) renewable energy generation is already included within the Site, providing much needed on-site generated zero carbon electricity, albeit a small proportion of the overall site demand.

The principal objective of the Proposed Development is to be able to provide renewable electricity for on-site use within the BRM operational site at Northfleet as part of the Applicant's wider sustainability initiatives; initiatives to minimise the carbon footprint of its commercial activities; and provide enhanced on-site energy resilience and further progress towards a circular economy. The ability to increase the capacity for on-site generation of renewable electricity through wind energy would significantly reduce the carbon emissions associated with energy use in its current operations and provide zero carbon generation outwith daylight hours, which is helpful given the site operates 24/7.

The principal permanent components of the Proposed Development are as follows:

- three wind turbines of up to 140 metres in height above foundations and associated crane pad hard standings;
- transformer kiosks adjacent to the turbine towers;
- interconnecting cables between the turbines; and
- a new substation.

In addition to the above, it is anticipated that there would be a need for temporary development areas. These are likely to comprise: laydown areas for components and a construction compound (to house site cabins and welfare facilities).

3.2 Site Design

3.2.1 Design Evolution

Assessment of potential locations for the Proposed Development was initially based on available land within the BRM estate, which is shown as the 'Study Area' on **Figure 1.1**. Within this, six potential initial turbine locations were identified, as shown on **Figure 3.1**, which provided the basis for a range of baseline and feasibility assessment studies including:

- wind resource assessment;
- aviation constraints assessment;





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- Initial Study Area
- Initial Potential Turbine Location

BRITANNIA REFINED METALS WIND ENERGY

EIA SCOPING

INITIAL POTENTIAL TURBINE LOCATIONS

FIGURE 3.1

Scale 1:4,000 @ A3

Date FEBRUARY 2025

- telecommunications and radar constraints assessment;
- required offset from National Grid assets;
- Preliminary Ecological Appraisal (2023);
- breeding bird survey (2023 and 2024);
- non-breeding bird (wintering) survey (2023/24 and 2024/25);
- vantage point bird survey (2023/24 and 2024/25);
- bat activity survey (2023 and 2024);
- reptile survey (2024);
- Water vole survey (2024);
- Dormouse survey (2024);
- invertebrate survey (2024);
- preliminary landscape and visual assessment (2023);
- preliminary heritage assessment (2023);
- preliminary noise assessment (2023); and
- preliminary transport route assessment (2023).

Pre-Application Consultation was undertaken with GBC in April 2024 and a Discretionary Advice Service (DAS) request was submitted to Natural England in January 2024 (Natural England subsequently confirmed that a response could not be provided due to resource constraints).

The wind resource assessment confirmed that there would be suitable wind energy conditions at all six potential turbine locations. The findings of the preliminary environmental assessments are summarised within the respective topic sections of this Scoping Opinion Request, but the conclusion of the initial assessment process was that development should focus on the existing operational area within the BRM estate, which enabled up to three turbines. This provided a coherent turbine layout; proximity to the point of electricity use and reduced cable runs; appropriate topple distance stand off from the UKPN overhead lines; and use of brownfield land.

3.2.2 Proposed Development Design

The layout of the Proposed Development is shown as **Figure 3.2**, with the potential turbine locations labelled A to C. Whereas the likely locations for turbines A and C are relatively fixed based on existing land uses, the potential zone for location of Turbine B has been indicated with a broader area on **Figure 3.2**. It is however envisaged that the preferred location for Turbine B would be towards the eastern end of the hatched zone.

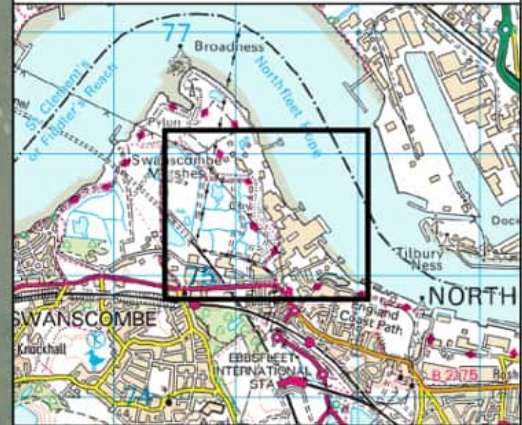
The applicant intends to use reconditioned turbines because these have good levels of availability, and their relative carbon footprint is lower than procurement of new turbines (as the embedded carbon has been paid off many times by the operational phase). The most likely specification of reconditioned turbines (tip height of up to 125 metres above foundation level) are comparable in height to the operational turbines at the Port of Tilbury and they enable more certain implementation of the Proposed Development because with new turbines designs are continually changing and it may be that by the time consent is gained, the anticipated turbine models are no longer in production.





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- Site Boundary
- Proposed Turbine Location
- Proposed Turbine Location 45 m Buffer



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BRITANNIA REFINED METALS WIND ENERGY
EIA SCOPING
PROPOSED TURBINE LOCATIONS

FIGURE 3.2

Scale 1:5,000 @ A3 Date OCTOBER 2024

404.063945,00001,0002,1 Proposed Turbine Locations

Two potential models of reconditioned turbines will be considered (Vestas V80 and V90) and the parameters for assessment within the ES will be based on the maximum potential dimensions / parameters and requirements of both. Key specifications for the V80 and V90 turbines are provided in **Table 3-1**.

Both potential candidate turbine models will consist of three bladed horizontal downward axis machines. The blades will be made from fibreglass-reinforced epoxy and the tower will be constructed from rolled steel plate. The finish and colour of the turbines are likely to be semi-matt and pale grey, subject to agreement with GBC.

Blades typically rotate in the range of 6 to 18 revolutions per minute, depending on the size of the turbine, with the V80 and V90 models generating power at wind speeds between about 4 m/s and 25 m/s (9-56 mph). When operating at higher wind speeds, the turbines will regulate their output to the maximum level using pitch control, whereby the blades are feathered to reduce speed. At wind speeds generally greater than 25 m/s, the turbines will shut down for self-protection and will only restart when wind speed drops back below a reset value.

Table 3-1: Potential candidate turbine specifications (information from Vestas.com)

	Vestas V90	Vestas V80
Rotor Diameter	90 metres	80 metres
Number of blades	3	3
Hub height	80 metres or 95 metres	80 metres or 100 metres
Total tip height above foundation level	125 metres or 140 metres	120 metres or 140 metres
Rated Power	2,000 kW / 2,200 kW	2,000 kW
Cut in wind speed	4 metres per second	4 metres per second
Cut out wind speed	25 metres per second	25 metres per second
Maximum sound power	104 dB	105.2 dB
Carbon footprint	9.7g CO ₂ e/kWh	9.2g CO ₂ e/kWh
Recyclability	82%	85%
Transformer	Within tower	External kiosk

Whilst the most likely envisaged candidate turbine would have the lower of the tower heights for each model, this cannot be determined at the EIA Scoping Stage. As such, all potential configurations of the two Vestas models with resultant tip heights of less than 150 metres AOD have been considered. It is envisaged that either a specific turbine model will have been selected at the ES stage, or the ES would assess the maximum potential parameters of both turbines and as such, would assume:

- total tip height of up to 140 metres above foundation (based on V80 or V90);
- rotor diameter of 90 metres (based on V90);
- use of an external transformer kiosk adjacent to each turbine (based on V80); and
- maximum sound power level based on the V90 turbine.

Turbine foundations are likely to be piled and these are envisaged to comprise either driven precast piles (concrete or steel), or continuous flight auger (CFA) excavation with pumped concrete and steel reinforcement. Pile depth would be confirmed by pre-commencement geotechnical investigation.



3.3 Electrical Layout and Grid Connection

The three turbines would be electrically connected to each other and an on-site substation via below ground cables. Each turbine will have a substation transformer which would house associated switch gear to convert the electricity generated into an appropriate voltage for use within the BRM operational site and onward transmission of any surplus generated electricity into the national grid. It is proposed that the primary substation would be located within the southern section of the Site.

Although it is envisaged that the majority of electrical power generated by the Proposed Development will be utilised within the BRM operational site, an application will be made to UK Power Networks (UKPN) for connection to the grid for residual power generated either at periods of high production or lower on-site demand. There is an existing UKPN substation within the southern section of the Site (shown on **Figure 2.3**) and connection would be made to this from the Application substation for the wind turbines. As such, there is no envisaged off-site grid connection work for the Proposed Development.

3.4 Site Access

Vehicular access to the Site would be via Manor Way and Lower Road. It is envisaged that turbine components would be delivered to the Port of Tilbury by sea, from where escorted abnormal indivisible load (AIL) movement would take place via the strategic road network including the A1089, A13, M25 and A2, with an approximate journey distance of 27 kilometres (16.8 miles) from the port to the Site.

Consideration is being given to the potential for some or all turbine components being delivered via the Seacon Terminals Limited facility adjacent to the Site or other port/terminal facilities, if feasible/viable at the time of construction. The potential role of local delivery of components via sea will be confirmed within the planning application and Proposed Development description within the ES.

By virtue of the nature of the operational BRM site, extent of existing hardstanding and the relatively short distances from Manor Way to the proposed turbine locations, it is not envisaged that any new dedicated access tracks will be required.

3.5 Project Construction

It is anticipated that the construction of the Proposed Development would be undertaken in phases that would be completed over a period of approximately five years from implementation of the consent (implementation is assumed to begin during 2026).

Crane pads will be required adjacent to each turbine location and will comprise areas of hardstanding that have suitable loading design for the crane(s) needed to assemble the turbines. The crane pads would be retained in situ for the operational life of the Proposed Development so that any required maintenance can be undertaken. It remains to be determined if some of the locations have suitable ground conditions to negate the need for the construction of crane pads at this stage.

A construction compound would be required during the construction phase. The construction compound would include site cabins and welfare facilities for construction workers and could also be used as a laydown area for the delivery of some materials. These would be temporary facilities for use during the construction period only.

It is envisaged that poured concrete for piled foundations will be locally sourced ready-mix to avoid the requirement for on-site concrete batching and the associated potential effects to the water environment.

All statutory legislation would be fully complied with during construction and other best practice guidance (e.g. former EA Pollution Prevention Guidelines) would be adhered to.



Construction mitigation and environmental protection measures would be detailed in a Construction Environmental Management Plan (CEMP) and would be fully implemented.

3.6 Project Operation and Maintenance

Routine operational and maintenance work would be carried out as necessary, but there would be no requirement for any associated permanent facilities for ongoing operations and maintenance.

3.7 Project Decommissioning

At the end of the operational lifespan, either decommissioning would take place, and the turbines removed, maintained/refurbished to extend their operational life or a new application made to re-power the site i.e. with newer technology or more efficient/more powerful turbines

3.8 Known cumulative development

The ES will include assessment of known cumulative developments, as agreed with GBC. As a minimum known cumulative developments will include the approved E-Scrap development on the central section of the Site ([KCC/GR/0050/2023](#)) and the Northfleet Harbourside development. Further information on proposed approach to cumulative assessment is provided in Chapter 14 of this Request.



4.0 Approach to the EIA Scoping Opinion Request

4.1 Background

This chapter provides a background to EIA Scoping and details the approach to determining the scope of the ES. The principal purpose of an ES is to report the findings of the EIA on the significant effects of an EIA development on its receiving environment. As described within section 1.0 of this report, the EIA PPG emphasises that the EIA process should focus on the likely significant effects associated with a Proposed Development, as opposed to all possible effects.

A comprehensive and focused Scoping Opinion that identifies the likely significant effects and any EIA methodologies that GBC (and relevant consultees) wishes to see employed will enable the production of an ES that provides a concise and objective analysis that deals with the significant areas of impact and highlights the key issues relevant to the decision-making process.

This approach is reinforced by case law from UK and European courts. Judgements have stated that even in relation to the minimum requirements for an ES, not every possible effect has to be considered. The focus should be on the main effects and remedying the significant adverse effects. The Milne judgement (R v Rochdale MBC ex parte Milne) states *“the environmental statement does not have to describe every environmental effect, however minor, but only the main effects or likely significant effects”*. In the Tew judgement (R v Rochdale MBC, ex parte Tew), the judgement noted that the underlying objective of EIA is that decisions be taken *“in full knowledge”* of a project’s likely significant effects and stated:

“that is not to suggest that full knowledge requires an environmental statement to contain every conceivable scrap of environmental information about a particular project. The directive and the Assessment Regulations require the likely significant effects to be assessed. It will be for the local planning authority to decide whether a particular effect is significant”.

There is no known formal definition of main or significant effects in the EIA Regulations, though guidance provided by the European Union² advises that:

“Those responsible for scoping often find difficulties in defining what is “significant”. A useful simple check is to ask whether the effect is one that ought to be considered and to have an influence on the development consent decision.”

Whilst scoping is an important (although optional) early stage in the EIA process because it can set the context for the remainder of the process, it should be approached with the above points in mind.

The principal objective of this Request for an EIA Scoping Opinion is to present known information on the receiving environment and the initial assessment by the Applicant on the likely significant effects on the environment resulting from the Proposed Development. The purpose of Scoping is to ‘scope in’ only those aspects considered to have the potential to result in likely significant environmental effects. Where a particular environmental feature or component of it has not been included within the proposed scope of the EIA, this is not to suggest that there will be no associated effects; rather that these are not considered to be among the significant effects.

As with EIA Screening, the 2017 EIA Regulations, in accordance with the Court of Appeal’s judgment in Loader [2012] EWCA Civ 869, allow mitigation measures that are modest in

² Guidance on EIA: Scoping, June 2001, Office for official publications of the European Communities



scope and/or plainly and easily achievable to be taken into account by the local planning authority when determining likely significant effects.

4.2 Approach to the Scoping Process

Potential topic areas for inclusion within the ES have been presented as individual chapters of this Request for a Scoping Opinion, with input provided by the respective technical specialists within the project team. These are presented under topic headings commonly used within EIA, and which relate to the factors set out in Regulation 4(2) of the EIA Regulations:

- a) *population and human health;*
- b) *biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC(b);*
- c) *land, soil, water, air and climate;*
- d) *material assets, cultural heritage and the landscape;*
- e) *the interaction between the factors referred to in sub-paragraphs (a) to (d).*

Some of these factors will have a directly applicable topic heading within this Request for a Scoping Opinion (e.g. heritage) whereas others such as material assets may be considered within a number of sections.

Each topic area within this Request for a Scoping Opinion will present a summary of the known baseline conditions and an interpretation of the envisaged sensitivity of receptors. It should be noted that this assessment is based on information available at the point that Scoping is undertaken. For some topics, there may have been specific baseline assessment undertaken, but for others this may follow the Request for a Scoping Opinion.

The Request for a Scoping Opinion will then summarise the envisaged potential significant effects taking account of the known baseline, receptor sensitivity and scale/nature of the Proposed Development. These effects are presented within a table in each chapter to clearly set out which aspects of each topic are considered potentially significant and hence are proposed for inclusion in the ES. To determine whether these effects are likely to be significant, the relative importance of the potential receptors (classified within this report as 'very high, high, medium, low or negligible') is compared to the magnitude of the envisaged changes (classified within this report as 'large, medium, small, negligible or no change') to which they would be subjected, using the matrix below.

Table 4-1: EIA Scoping Matrix

Importance or Sensitivity of the Receptor	Envisaged scale or magnitude of change					
		Large	Medium	Small	Negligible	No change
	Very High					
	High					
	Medium					
	Low					
	Negligible					



Where a predicted effect falls within the green shaded area of the matrix, it is considered likely to be significant and should be included within the scope of the EIA. Effects falling within the grey areas on the matrix are considered to have no likelihood of being significant and should not be included within the scope of the EIA. Where an effect falls within the white area on the matrix, this may or may not be considered likely significant and explanation will be provided within the supporting text analysis. This will be based on the experience of the assessor. For some effects, the uncertainty may be such that it cannot be confirmed at the Scoping stage whether it is likely to be a significant effect or not. Such effects warrant further consideration through the EIA process on a precautionary basis and hence these effects will be included in the scope of the EIA.

For those aspects within a topic area that are assessed as being likely significant, the proposed methodology will be explained, including reference to relevant standards and guidance that will be referenced within the assessment in the ES. At the end of each topic section there will be a table summarising the proposed geographical scope of assessment, the proposed scenario years for that assessment and the principal technical guidance that will be followed through the assessment.



5.0 Assessment of likely environmental effects

5.1 Introduction

This section details the proposed approach to setting the assessment parameters and the overall approach within the ES for assessing the significance of effects. The proposed scope of assessment for each of the environmental issues to be addressed within the ES is then described in subsequent chapters of this report.

There is no standard format for an ES, however the EIA Regulations require that an ES at least contains the information specified in Regulation 18(3) and must meet the requirements of Regulation 18(4). It must also include any additional information specified in Schedule 4 of the Regulations (refer to **Appendix A** of this Request) that is relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.

The description of the Proposed Development contained within the ES must be sufficient to enable the requirements of the EIA Regulations to be fulfilled, specifically to enable the likely significant effects of the Proposed Development to be identified.

The assessments included within the ES will be based on a detailed description of the Proposed Development, the maximum turbine parameters detailed in **Table 3.1**, and a series of planning application drawings, which are envisaged to include:

- Site Location Plan;
- Block Plan / Proposed Development Layout;
- plan view of turbine base and associated crane pad(s);
- plan and elevation of the proposed turbine dimensions;
- plan and elevation view of Transformer Kiosks; and
- plan and elevation view of the Primary Substation.

There will be a range of other illustrative plans in the planning application and other key planning application documents will include a Planning Statement, Design and Access Statement, and Statement of Community Involvement.

5.2 Assessment scenario years

The baseline conditions for the ES will be taken from relevant seasonal periods in 2023 and 2024. The EIA will assess the effects during the construction, operational and potential decommissioning phases of the Proposed Development. It is currently anticipated that the Proposed Development may be constructed in phases but that all construction would be envisaged to be complete by 2031. Assessments of impact will therefore be either based on the maximum parameters of the Proposed Development using a comparison between the baseline and completed development in 2031.

5.3 Overarching approach to impact assessment within the ES

For each topic included in the ES, a proportionate technical assessment will be carried out based on the scope set out within this report and the received EIA Scoping Opinion. Each technical assessment will be undertaken by an appropriately qualified consultant to prevailing technical standards.

The technical assessments will provide a detailed assessment of likely impacts, identification of mitigation measures and description of the significance of residual effects (those remaining after the mitigation measures have been incorporated). The ES will identify direct



and indirect effects; positive (beneficial) and negative (adverse) effects; and will seek to identify, as far as possible, the duration of such effects, whether short term, long term, permanent, temporary, periodic, etc. during the construction and operational phases of the Proposed Development.

The specific approach to the assessment of effect significance will be described in the respective technical topic chapters but the general approach is based on the methodology set out in the Design Manual for Roads and Bridges (DMRB³).

Assessment of receptor sensitivity will be generally described using the scale shown in **Table 5-1**; the magnitude of impact or change will be generally described based on the scale shown in **Table 5-2**; and then a combination of these factors will be used to arrive at the predicted significance of effect using **Table 5-3**. Within this ES, effects below 'Moderate' will not be considered to be significant in EIA terms.

Table 5-1: General approach to description of receptor sensitivity

Sensitivity (value/importance) of the receptor	Typical description
Very High	Very high importance and rarity, international scale, and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Table 5-2: General approach to description of impact magnitude

Magnitude of impact (change)		Typical description
Large	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Medium	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Small	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.

³ LA104 Environmental Assessment and Monitoring, Revision 1 (August 2020)



Table 5-3: Significance Matrix

Receptor sensitivity	Magnitude of impact (degree of change)					
		Large	Medium	Small	Negligible	No change
	Very High	Major	Major	Moderate	Slight	Neutral
	High	Major	Moderate	Slight	Negligible	Neutral
	Medium	Moderate	Moderate	Slight	Negligible	Neutral
	Low	Slight	Slight	Negligible	Negligible	Neutral
	Negligible	Negligible	Negligible	Negligible	Negligible	Neutral

The results of each technical assessment will be reported in the ES, and ES chapters will be accompanied by technical appendices and illustrative material where needed.

5.3.1 Approach to technical topic chapters of the ES

The assessment methodology will be presented in each technical chapter of the ES and will follow relevant technical guidance such as the Guidelines for Landscape and Visual Impact Assessment (GLVIA3). Each technical topic chapter will follow the general methodology as per **Table 5-4** below.

Table 5-4: Technical Topic Chapter general structure

Technical Assessment	Scope
Planning Policy and Legislative Compliance	Relevant legal considerations or standards for the impact assessment, together with national, regional, and local policy and industry guidance that has informed the assessment.
Assessment Methodology and Significance Criteria	The methodology, technical, spatial, and geographic scope (study area) of the assessment, with reference to any published methodological standards, professional guidelines, and best practice that are particular to the topic. How baseline conditions have been assessed (e.g. site visits, surveys, review of publicly available data) and the scale of sensitivity and magnitude adopted within the assessment. How impact significance has been assigned (e.g. whether a topic specific matrix or some other approach has been adopted). Any assumptions or limitations.
Baseline Conditions	The baseline conditions section of the technical assessment identifies the key receptors a proportionate description of those receptors and the sensitivity attributed to each receptor. Considers current and likely future baseline (as applicable to each topic).
Assessment of Effects	The assessment of potential effects/ impacts that are predicted to occur during the construction and operation of the Proposed Development considers the activities and physical elements of the development that are likely to give rise to particular impacts. It considers and identifies the receptor(s) that are likely to be affected. Any specific design principles or mitigation measures that have already been incorporated into the design of development to avoid or minimise the environmental effects (i.e. 'primary/embedded mitigation') are described and the significance of the effect



Technical Assessment	Scope
	(including consideration of any embedded mitigation measures) are detailed. The significance criteria applied to the environmental effects is in accordance with the relevant methodologies <u>prior</u> to the application of any secondary mitigation. Assigning significance in this way ensures consistency across the technical assessments.
Mitigation and Monitoring	The specific mitigation and enhancement measures included for the Proposed Development in response to potential environmental impact is identified within the individual technical assessments. This section includes details of additional (bespoke) secondary mitigation and/or enhancement measures being proposed.
Residual Effects	Where there are predicted significant residual effects for a technical topic chapter (i.e. those assessed to be above 'moderate' following the application of secondary mitigation), these will be reported at the end of that chapter.

5.3.2 Cumulative Effects Assessment

In accordance with the EIA Regulations, the ES will include an assessment of direct and indirect cumulative effects arising from the Proposed Development when considered alongside any other developments in the area surrounding the Site. The objective will be to identify any combined effects from the Proposed Development or effects from several developments which, whilst individually the effects may be insignificant, when considered together they could cause a significant direct or indirect effect requiring mitigation.

In relation to other development, best practice dictates that cumulative assessments of this nature should have regard to those schemes which are 'reasonably foreseeable' (i.e. usually those under construction, with an extant planning permission or are subject of a suitable development plan allocation). The assessment of cumulative effects within the ES will only be capable of being carried out based on the information available at the time of assessment.

5.3.3 Non-Technical Summary

As required by the EIA Regulations a Non-Technical Summary (NTS) will be prepared as part of the ES. The NTS is an important document as it provides a concise summary and account of the ES and explains the findings of the technical assessment in non-technical language.

5.4 Preliminary Envisaged Technical Topics

The preliminary technical scope of the EIA for assessment within this Scoping Opinion Request has been determined with reference to Schedule 4 of the EIA Regulations. The effects of the Proposed Development on the environmental topics that could be included within the ES are set out in alphabetical order in sections 6 - 13 of this report:

- Communications;
- Terrestrial and Aquatic Ecology;
- Heritage;
- Ground Conditions and Groundwater;
- Landscape and Visual Impact;



- Noise;
- Ornithology; and
- Traffic and Transportation.

5.5 Topics not included in the Preliminary Scope of the EIA

Taking account of the scale and nature of the Proposed Development described within Chapter 3 of this Scoping Opinion Request and the specific geographic context of the Site, the following topics are not considered likely to have potential for significant effects and are therefore not proposed for inclusion within the scope of the ES.

- Air Quality;
- Aviation;
- Climate Change;
- Population, Human Health and Economics/Employment;
- Risk of Major Accidents and Disasters including ice throw;
- Shadow Flicker;
- Surface Water; and
- Waste.

In line with the EIA PPG, “*impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered*”⁴. Explanation for each topic is provided below.

5.5.1 Air Quality

The Site was formerly located within the Northfleet Industrial Area AQMA, which was declared in January 2002 for Particulate Matter. This was revoked by GBC in January 2024 following 15 years of continuous compliance with the national objective. Background pollutant mapping concentrations for a 1-kilometre grid square within the Site (561500,175500)⁵ suggest an annual average concentration of 14.73 ug.m⁻³ for nitrogen dioxide (NO₂) and 15.05 ug.m⁻³ for particulates (PM₁₀). These concentrations compare favourably to the national annual average objective for both pollutants of 40 ug.m⁻³.

There are other AQMAs within the vicinity of the Site including three within Gravesham Borough and three within Dartford Borough. By virtue of the most likely delivery route for turbine components described within Chapter 3 of this Scoping Opinion Request (M25 / A2 / A226 / Lower Road / Manor Way) and the presence of a ready mixed concrete (RMC) plant within the Northfleet Industrial Area approximately 800 metres southwest of the Site, it is not envisaged that there would be construction traffic movements through five of these AQMAs.

Construction traffic movements would be required through Dartford AQMA No.1, which is the A282 Dartford Tunnel Approach, declared for annual mean NO₂ and 24-hour mean PM₁₀. Daily HGV movements associated with transport of wind turbine components from the Port of Tilbury to the Site would be up to approximately 10 HGV trips (20 one-way movements) per turbine (3x or 4x tower sections; 3x blades; 1x nacelle; 1x hub and rotor; and 1x drive

⁴ <https://www.gov.uk/guidance/environmental-impact-assessment> (Paragraph: 035 Reference ID: 4-035-20170728)

⁵ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>



train). When compared to the very high background traffic flows through the A282 Dartford Tunnel Approach, reported by National Highways⁶ to be on average 150,000 vehicles per day including approximately 40% freight or HDVs, the additional movements associated with delivery of wind turbine components would be a negligible proportional increase, which would not have a significant effect on emissions or air quality.

Once the Proposed Development was operational, there would be no requirement for daily road traffic movements and no operational emissions to air. As such there would be no likely air quality effects associated with the construction or operation of the Proposed Development.

Construction dust has the potential to affect human and ecological receptors. For human receptors, the screening criteria referenced by the Institute of Air Quality Management (IAQM)⁷ suggest a radius of approximately 250 metres from a construction site boundary and 50 metres from routes used by construction vehicles (up to 250 metres from the Site entrance). For ecological receptors, these guidance zones are within 50 metres of the construction site boundary or 50 metres from routes used by construction vehicles (up to 250 metres from the Site entrance).

The scale and nature of construction works, along with the proposed use of RMC suggest the following assessment using the IAQM criteria:

- **earthworks** – ‘small’ site based on the area of proposed construction and limited earthworks required for the Proposed Development (i.e. <5 heavy earth moving vehicles at any one time and no bunds envisaged);
- **construction** – ‘small’ site based on area of construction and low potential for dust release from piling activities and use of RMC; and
- **trackout** – ‘small’ site with <20 Heavy Duty Vehicle (HDV) outward movements in any one day. Surface material with low potential for dust release and short sections of unpaved road.

Using the IAQM criteria, the human receptors within 250 metres of the Site boundary would be considered of ‘low’ sensitivity because these are within an existing industrial / commercial land use context. Ecological receptors within 50 metres of the Site boundary and access roads (Swanscombe Peninsula SSSI) would be considered as ‘high’ sensitivity. With the assessed ‘small’ magnitude of dust emissions associated with earthworks, construction and trackout for the specific context of the Proposed Development, the resultant risk of dust impacts would be ‘negligible’ for human receptors (dust soiling and human health) and ‘low to negligible’ for ecological receptors.

Standard and proven construction/demolition methodologies are available to minimise dust effects as set out in the IAQM guidance, which states that following the application of appropriate levels of mitigation to control dust emissions (as set out therein) residual effects will be reduced to a level that is “*not significant*”. A Construction Environmental Management Plan (CEMP) can be conditioned as part of any planning consent to secure these measures. The CEMP would be based upon the schedule of mitigation that will be presented in the final ES document.

It is therefore proposed that assessment of air quality is not included within the scope out of the ES.

⁶ <https://nationalhighways.co.uk/our-roads/lower-thames-crossing/the-need-for-the-lower-thames-crossing/the-dartford-crossing/>

⁷ Guidance on the assessment of dust from demolition and construction, Version 2.2, IAQM, January 2024



5.5.2 Aviation

The Site is in uncontrolled (Class G) airspace extending from surface level up to 2,500ft above sea level (asl). Above 2500ft is Class A controlled airspace of the London Terminal Control Area (TMA).

Visual Flight Rules (VFR) traffic is not permitted in London TMA airspace. All VFR traffic in the area is therefore operating at less than 2550ft asl. VFR traffic over the Northfleet area is also constrained horizontally by the controlled airspace associated with London City Airport to the west and Southend Airport to the east. The result is that there are significant volumes of VFR traffic routing north-south and south-north over this area. Instrument Flight Rules traffic (such as airliners and business jets) in London TMA airspace associated over the Site area includes:

- inbounds to Biggin Hill;
- inbounds to London City;
- inbounds to Southend; and
- inbounds from London Gatwick.

Air Traffic Control primary surveillance radars (PSRs) with the potential to detect turbines on the Site are as follows:

- NATS En Route Debden;
- NATS En Route Bovingdon;
- NATS En Route Pease Pottage;
- NATS En Route Heathrow; and
- Southend Airport.

The Site is within the assessment area for Instrument Flight Procedures (IFPs) at Southend, London City and Biggin Hill Airport. Turbines on the Site would be beyond the range of all Ministry of Defence (MoD) radars and the Site is completely within the Thames Valley Avoidance Area in the UK Military Low Flying System so military aviation impacts can be discounted.

A radar line of sight assessment was carried out based on provisional turbine locations and specification (125-metre tip height); this indicates that a wind turbine with a tip height of up to 125 metres is unlikely to be visible to any PSRs used by NATS En Route. A turbine of up to 150 metres in height is likely to be visible only to the Heathrow radar and this was an influence on the preferred turbine specification. The effect of the Proposed Development on aviation radar is likely marginal but the need for further analysis will be considered based on the proposed turbine locations.

Instrument flight procedures (IFPs) set out minimum altitudes for aircraft to fly on departure from and approach to an airport in order to ensure 1,000 feet vertical separation (less in the approach phases) from all terrain and obstacles. IFP assessment areas extend to 25 nautical miles (nm) (plus a 5nm buffer) from all Initial Approach Fixes (IAFs) in a published procedure. Where a new obstacle would require any of the procedure minima to be raised, the procedure has to be re-designed and new charts approved by the CAA and issued. Biggin Hill, London City and Southend IFPs would not be affected by wind turbine development at the Site.

Based on the assessment undertaken to date and the context of the Site in respect of aviation receptors, there would be no likely significant effects of the Proposed Development. It is proposed that a technical assessment report on aviation would be submitted as part of the planning application for consultation with NATS En Route Ltd and other appropriate



aviation consultees, but that this topic is not included within the scope of the ES as significant effects are unlikely.

5.5.3 Climate Change

The principal objective of the Proposed Development is the generation of additional on-site renewable energy for the operational BRM facility at Northfleet to assist in the Applicant's wider sustainability initiatives; and initiatives to minimise the carbon footprint of its commercial activities and provide enhanced on-site energy resilience on its route to Net Zero. The potential renewable energy generation from the Proposed Development and proportionate reduction in carbon emissions associated with generation of electricity from non-renewable sources is therefore highly significant at the individual business level.

Although the typical projected carbon payback time for the life cycle of a V90 turbine is approximately 9 months⁸, the proposed use of reconditioned turbines means that the life cycle carbon emissions associated with the manufacture and materials for the turbines will have been offset by carbon savings associated with renewable energy generation from these particular turbines many times over already.

Whilst the potential renewable energy generation and carbon savings are significant at a business level and will enable the Proposed Development to be compatible with local and national trajectory towards Net Zero, when compared carbon budgets at local and national levels, the likely beneficial reduction in carbon emissions associated with the Proposed Development would not be considered a significant effect in an EIA context. For this reason, it is proposed that climate change is not considered as a technical assessment topic within the ES.

5.5.4 Population, Human Health and Economics/Employment

The EIA Regulations 2017 include a requirement to assess the potential significant effects on population and human health resulting from the Proposed Development as part of the EIA process. These topics are often also considered in conjunction with economics and employment.

The nature and scale of the Proposed Development is such that it will have no material effect on population or demographics during the construction or operational phases. Relevant aspects associated with human health are discussed in terms of air quality, climate change and ice throw below; and shadow flicker below. For all of these topics, no significant effects are likely. Potential human health effects associated with noise are considered within Chapter 11 of this Scoping Opinion Request.

With respect to economics and employment, the objective of the Proposed Development is to build site energy resilience and decarbonise the on-site activities, thereby also contributing to the long-term security of the BRM facility as a local employer (as opposed to primarily generating commercial revenue). There will be short term construction employment generation associated with the Proposed Development, but this will predominantly be in specialist skilled roles and its unlikely to represent a source of new jobs in its own right. There will be some associated local revenue linked to the construction phase of the Proposed Development, but this is not envisaged to be over a long period of time. Whilst there will be beneficial economic and employment effects associated with the Proposed Development, when compared to baseline at Borough and County level, these are not likely to be significant in EIA terms and as such, it is proposed that this topic is not included within the scope of the ES.

⁸ <https://www.vestas.com/en/pages/backup-2-mw-platform/V90-2-0-MW>



5.5.5 Risk of Major Accidents and/or Disasters

The Proposed Development does not fall within the scope of EU legislation 2012/18/EU (control of major-accident hazards involving dangerous substances) or Council Directive 2009/71/Euratom (Community framework for the nuclear safety of nuclear installations) as identified in Schedule 4 of the EIA Regulations.

The Proposed Development would be constructed in accordance with relevant prevailing health and safety legislation and would be subject to routine inspections during operation. Braking mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe windstorms be experienced, then the turbines would be shut down (25 metres per second for the Vestas V80 and V90 models). An appropriate topple distance of at least 110% of the maximum turbine height has been applied to the existing UKPN high voltage line that partially crosses the southern section of the Site.

With respect to vulnerability to flood risk, wind energy developments are considered 'essential infrastructure' and are thus compatible with development in Flood Zones 2 and 3 subject to appropriate flood resilience design. The small footprint of the Proposed Development in the context of the Thames Estuary and associated flood zones are such that the construction of the Proposed Development will not increase the risk of flooding elsewhere. Therefore, it is considered unlikely that significant effects in respect of major accidents and/or disasters will arise because of the Proposed Development, and it is proposed that this topic is not included within the scope of the ES.

5.5.5.1 Ice Throw

Ice build-up on blade surfaces can occur in cold weather conditions. Turbines can continue to operate with a very thin accumulation of snow or ice but will shut down automatically as soon as there is a sufficient build up to cause aerodynamic or physical imbalance of the rotor assembly. The build-up of ice on turbine blades is unlikely to present problems on the majority of sites in England, especially at sea level and near the coast. For ice to build up on wind turbines particular weather conditions are required for ice to build up and in England these occur on average for less than one day per year⁹.

There is potential for ice throw to occur after start up following a turbine shut down during conditions suitable for ice formation. There are monitoring systems and protocols in place to ensure that turbines that have been stationary during icing conditions are restarted in a controlled manner to ensure public safety. In the locations chosen, there are limited opportunities for member of the public to be within ice throw range, even if the conditions were to occur and employees from BRM can be notified to take action if there were ever to be a risk on site.

The risk to public safety is considered to be very low due to the few likely occurrences of these conditions along with the particular circumstances that can cause ice throw., and the proposed turbine locations. Due to the very low risk, it is proposed that ice throw is not included within the scope of the ES

5.5.6 Shadow Flicker

Shadow flicker occurs when a combination of conditions prevails at a location, time of day and year. It typically requires the sun to be at a low level in the sky. The sun then shines onto a window of a building from behind the wind turbine rotor. As the wind turbine blades rotate this causes the shadow of the turbine to flick on and off. This may have an amenity effect on residents in affected properties.

⁹ Wind Energy Production in Cold Climate (WECC) (2000)



If shadow flicker cannot be avoided through design, technical mitigation solutions are available, such as shutting down turbines during the short period(s) when the potential for shadow flicker effects may occur.

A report prepared by Parsons Brinckerhoff Consultants on behalf of DECC *Update of UK Shadow Flicker Evidence Base* (2010) confirmed that in the UK, significant shadow flicker is only likely to occur within a distance of ten times the rotor diameter of a wind turbine, from an existing residential dwelling and within 130 degrees either side of north¹⁰. The guidance notes that at latitudes within the UK, wind turbines do not cast long shadows on their southern side.

Review of local land use within ten rotor diameters (900 metres based on the V90 turbine) and within 130 degrees either side of north for each of the three proposed turbine locations indicates that there are no existing residential dwellings within the potentially affected zone. Considering the potential location of future residential dwellings if the Northfleet Harbourside development is granted planning permission and implemented in full, these would also fall outwith the potentially affected shadow flicker zone.

With no existing or known future residential dwellings within the potentially affected shadow flicker zone from the Proposed Development, there would be no likely significant effects, and it is therefore proposed that this topic is not included within the scope of the ES.

5.5.7 Surface Water

The majority of the Site lies within Flood Zone 3 meaning the land has an annual probability of river flooding of 1% or greater or an annual probability of flooding from the sea of 0.5% or greater. Small areas of the Site are shown to be within Flood Zone 2 (land having an annual probability of river flooding between 1.0% and 0.1% and annual probability of sea flooding between 0.5% and 0.1%); this assumes no flood protection and the Site benefits from protection from the Thames Flood Wall. Although Wind Energy development is classed as 'Essential Infrastructure' in terms of vulnerability to flood risk within Annex 3 to the NPPF and the Planning Practice Guidance: Flood Risk and Coastal Change (2022), a Flood Risk Assessment will be required as part of the Proposed Development.

The Proposed Development will be predominantly undertaken on previously developed land that has an impermeable surface. It will add a very limited impermeable area and the pattern of surface water drainage for the Site will be maintained. Design of the Proposed Development will incorporate appropriate flood resilience such that this meets the test in the Planning Practice Guidance for development of Essential Infrastructure within Flood Zone 3 (i.e. remain operational and safe during times of flood). The Proposed Development is therefore not envisaged to be at risk of flooding or have the potential to increase off-site flood risk.

Whilst there will be construction activities in close proximity to the Thames Estuary and the vegetated drainage channel crossing the central section of the Site (which discharges into the adjacent Thames Estuary), the potential surface water risks associated with construction contaminants or sediment-laden runoff would be effectively managed through commonly-applied good practice pollution control measures (e.g. former EA Pollution Prevention Guidelines including measures such as sediment barriers and appropriate management of fuels and lubricants within a construction compound). These would be detailed, confirmed and implemented through a CEMP. In this context, significant effects on surface water

¹⁰http://www.decc.gov.uk/en/content/cms/meeting_energy/renewable_ener/ored_news/ored_news/uk_shad_flick/uk_shad_flick.aspx



receptors are not likely and it is proposed that this topic is not included within the scope of the ES.

Assessment of potential effects to groundwater are however considered within Chapter 10 of this Scoping Opinion Request, alongside ground conditions.

5.5.8 Waste

The nature of the Proposed Development and principal inputs to construction (i.e. major prefabricated turbine components, RMC and steel) are such that there will be very limited generation of construction waste. All construction waste generated will be managed in accordance with the requirements of the Waste Collection Authority and the volume of any waste requiring final disposal is envisaged to represent a very small proportion of available waste management capacity, which would not be significant in EIA terms.

Once operational, there will be no regular presence of personnel on the Site, no significant effects are considered likely. Where turbine components require replacement through the operational life of the Proposed Development, these will either be subject to appropriate waste management under the prevailing regime, or materials will be recycled (the V90 turbine has a reported 82% materials recyclability¹¹). As such, waste management is not proposed as part of the EIA scope.

¹¹ <https://www.vestas.com/en/pages/backup-2-mw-platform/V90-2-0-MW>



6.0 Communications

6.1 Introduction

Tall structures such as wind turbines can adversely affect the performance of fixed telecommunications links and other associated links such as marine radar and VHF radio. The Site is in an area of significant industrial, commercial and residential development with a high density of telecommunications infrastructure. Point to point microwave telecommunications links can be affected by scattering and/or reflection of the signal if a wind turbine is located sufficiently close to the line of sight of the link

6.2 Known Baseline Conditions

Review of the potential location of fixed communication links was undertaken using the Ofcom Wireless Telegraphy Register and the fixed links crossing the Study Area are shown in **Table 6-1**.

Table 6-1: Fixed microwave communications links from the Ofcom Wireless Telegraphy Register

Ofcom reference	Operator	From	To	Lowest frequency (GHz)	Path length (km)	Maximum 2 nd Fresnel Zone (m)
1131256/3	Telefonica	TQ 59847 72432	TQ 61533 78184	22.372	5.994	6.3
1184756/1	Port of London Authority	TQ 62320 74792	TQ 60646 76470	37.415	2.402	3.1
1270803/1	Port of London Authority	TQ 62344 74782	TQ 60641 76475	37.072	2.402	3.1
1283747/1	Port of London Authority	TQ 66423 74226	TQ 50749 79333	12.793	16.486	13.9
1270708/1	Port of London Authority	TQ 65097 74421	TQ 50744 79337	17.8375	15.173	11.3
1108297/1	Port of London Authority	TQ 65097 74424	TQ 50777 79327	18.03	15.138	11.2
0450835/1	Port of London Authority	TQ 65100 74400	TQ 50700 79300	12.933	15.212	13.3
1277530/1	Skyline Networks & Consultancy Ltd	TQ 68282 70938	TQ 43412 86358	18.3875	29.265	15.5

Of these links, the evolution of the design for the Proposed Development from the Study Area to the proposed Site boundary (shown in **Figure 1.1**) has removed the potential for effects to the identified Telefonica and Skyline Networks fixed links.



A consultation response from the Joint Radio Company indicates that there are no power industry scanning telemetry links with the potential to be affected by a wind turbine within the Site.

Further consultation has been undertaken with the Port of London Authority (PLA) with respect to its identified fixed microwave communications links that cross the Site, and this has been taken into account as part of the ongoing development of design for the Proposed Development.

The consultation with the PLA has also highlighted potential effects on its marine radar coverage in this part of the Thames Estuary and radio communications with vessels. The PLA operates a network of marine radars to monitor shipping traffic in the Thames Estuary. One of these is located at Broadness, approximately 700 metres north of the Site. Another is located in Northfleet Harbour, approximately 1 kilometre (0.6 miles) southeast of the Site. These radars can be affected by 'multipath' effects, where the transmitted and/or received signal from a valid target (in this case a ship) is reflected via another object in the radar's coverage, resulting in the displayed position of the valid target being incorrect.

PLA advised that the proposed turbine locations have a high probability of interference with Broadness and Northfleet radars, and that the potential to mitigate this interference by tuning the radars would need to be assessed. For the Broadness Radar, PLA confirmed that the proposed turbine locations would generate radar shadows along Gravesend Reach (southeast of the Site along the estuary). Northfleet primary coverage area would not be affected by any of the turbines, however, the resilience it provides upriver in the event of a fault at Broadness would be compromised by the Proposed Development.

With respect to radio communications with vessels, the PLA confirmed that the Proposed Development could affect radio coverage upriver from Broadness. The worst case predicted values are however still better than the sensitivity of an average handheld radio at 2 metres above ground level (AGL). The PLA suggested that the risk of radio interference is lower than microwave/radar, however it is also the easiest to mitigate, for example adding additional receivers at Broadness/Crayford.

6.3 Key Issues and Requirement for Assessment

The consultation to date has confirmed that the assessment within the ES will need to include:

- **fixed microwave communication links** – this will include potential effects to those PLA fixed links crossing the Site within an agreed zone of effect from the proposed wind turbine locations;
- **marine radar** – this will include potential effects on the PLA marine radar coverage from the Broadness and Northfleet radars; and
- **radio communications with vessels** – this will consider the potential effects on the PLA radio coverage upstream of the Site.

The rotating rotor blades of wind turbines can also affect the reception quality of terrestrial television signals when the wind development is located between the receiving aerial and the television transmitter. These effects are rare since television transmissions were converted to digital format in the 2010s.

The intent of this section of the Scoping Opinion Request is to determine whether individual elements should be included within the ES scope, rather than provide a detailed appraisal of likely impact (this will be provided within the ES). A summary of potential issues for inclusion in the ES for communications is provided in **Table 6-2** below.



Table 6-2: Summary of potential significant effects – Communications

Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Effect of the operation of turbines on fixed microwave communications links	High	Medium to Large	Yes – included
Effect of the operation of turbines on marine radar coverage	High	Medium to Large	Yes – included
Effect of the operation of turbines on PLA radio communication with vessels	High	Low to Medium	Yes – included
Effects of the operation of turbines on television transmission	Medium	Low	Yes – included

6.4 Assessment Methodology

6.4.1 Proposed study area extent

The proposed study area extent will include the Site (for fixed microwave links, marine radar and radio communication with vessels), and the shadow zone extents advised by the PLA through consultation for marine radar and radio communications with vessels.

6.4.2 Legislation, standards and guidance

The assessment will be undertaken principally through direct ongoing consultation with the PLA but set in the context of the following Ofcom guidance:

- *Tall structures and their impact on broadcast and other wireless services* (August 2009); and
- *Measurement Assessment of Potential Wind Farm Interference to Fixed Links and Scanning Telemetry Devices*, ERA Technology Ltd for Ofcom, March 2009.

6.4.3 Approach to the baseline assessment

Initial baseline assessment and consultation with operators has commenced, as described in Section 6.2 above, and this will continue, with further specific consultation with the PLA based on the updated proposed turbine locations and specification.

It is likely that this assessment will include confirmation of specific link locations, which may involve survey of start and end points to provide a more detailed understanding of the link paths crossing the Site in three dimensions. Further engagement will be undertaken in respect of television services.

6.4.4 Assessment of impact and significance

The approach to the assessment of impact and significance for communications differs from other topics within the ES because the potential impacts of the Proposed Development will either be determined as acceptable or unacceptable by respective operators. Where an operator advises that an impact is unacceptable, this would be deemed significant in EIA terms before the application of mitigation.

Assessment of impact will be undertaken in consultation with the PLA based on the developed design for the Proposed Development. This assessment may include further



detailed modelling of proximity to fixed communications links, radar shadow zones and extents of potential interference with radio communications. Subject to advice from the PLA, an assessment of radar tuning potential may be undertaken.

The potential for adverse effects on television reception to occur due to the Proposed Development will be assessed by identifying the main and local television transmitters serving the area and mapping their coverage areas; using BBC criteria to identify areas of potential effects on reception; and carrying out a map study of the presence of domestic properties within the potentially affected areas.

6.4.5 Determination of mitigation

Determination of potential appropriate and effective mitigation will be undertaken in consultation with the PLA.

Potential means of mitigation of effects on television reception include switching receiver antennae to an alternative transmitter, installation of higher performance antennae, or provision of satellite TV service.

6.5 Summary of the Proposed Methodology

A summary is provided in **Table 6-3** of the proposed geographical scope of assessment, scenarios to be assessed and principal technical guidance applicable to this topic within of the ES.

Table 6-3: Summary of proposed methodology – Communications

Aspect	Proposed approach
Geographical scope / study area	Assessment within the Site Assessment within the shadow zones for marine radar and radio communications with vessels advised by the PLA Respective coverage areas of potentially affected television transmitters.
Scenarios to be assessed	2025 baseline
	Construction Phase impacts
	2031 completed development
Principal technical guidance to inform the assessment within the ES	<i>Tall structures and their impact on broadcast and other wireless services</i> (Ofcom, August 2009)
	<i>Measurement Assessment of Potential Wind Farm Interference to Fixed Links and Scanning Telemetry Devices</i> , ERA Technology Ltd for Ofcom, March 2009



7.0 Terrestrial and Aquatic Ecology

7.1 Introduction

This chapter of the EIA Scoping Opinion Request describes the baseline conditions, relevant guidance and legislation, proposed scope of assessment and methodology, proposed mitigation, and identified potential impacts of the Proposed Development in relation to terrestrial and aquatic ecological features. Proposed approach to the assessment of ornithology is provided within Chapter 12 of this Scoping Opinion Request.

7.2 Known Baseline Conditions

7.2.1 Desk Study

An ecological data search was received from the Kent and Medway Biological Records Centre (KMBRC) on 31st August 2023, providing records of statutory and non-statutory protected sites and of protected and otherwise notable species, for the Study Area and land within a 2-kilometre (1.25 mile) radius of it.

An internet-based desk study was also undertaken, whereby the Multi-Agency Geographic Information for the Countryside (MAGIC) website (<http://magic.gov.uk>) was searched for statutory designated sites, habitats and European Protected Species (EPS) Licences, the following search radiuses were used:

- International Statutory Sites - 10 kilometres (6.3 miles);
- National Statutory Sites - 5 kilometres (3.1 miles);
- Ancient Woodland and Priority Habitats - 2 kilometres (1.25 miles); and
- European Protected Species (EPS) Licences - 2 kilometres (1.25 miles) for all species except bats, which was extended 4 kilometres (2.5 miles).

These designated sites are shown on **Figure 7.1**.

7.2.1.1 Statutory Designated Sites

The data search received from the KMBRC and obtained from MAGIC confirms that there is one SPA and one Ramsar site within 10 kilometres (6.3 miles) of the Site, and one National Nature Reserve (NNR), nine SSSIs, and one Marine Conservation Zone (MCZ) within 5 kilometres (3.1 miles) of the Site. The nationally designated Swanscombe Peninsula SSSI is adjacent to the Site boundary. All sites found within the search radius are described below in detail within **Table 7-1**.

Table 7-1: Statutory Designated Sites

Site Name	Distance and direction from the Site	Area (ha)	Site Description
Swanscombe Peninsula SSSI TQ 6072 7632	Adjacent, to the west	259	Area of open mosaic habitat on previously developed land and traditional estuarine habitat which connects Ebbsfleet Valley to the Southern shore of the Inner Thames Estuary between Dartford and Gravesend. This site includes chalk pits, free-draining grassland, scrub, wetlands, grazing marsh and saltmarsh. It is a site of special interest due to its nationally important assemblages of invertebrates and breeding birds, populations of five species of vascular plant, and its geological features.
Swanscombe MCZ TQ 5941 7633	0.9 km NW	312	The Thames is an important and protected tidal river. The seabed of the Swanscombe MCZ is composed of shells, pebbles, sand and mud, suitable for supporting tentacled lagoon worms <i>Alkmaria romijni</i> which is found in the intertidal mud and soft sediments. This



Site Name	Distance and direction from the Site	Area (ha)	Site Description
			worm is scarce throughout the UK and forms part of a highly productive ecosystem which is important for wading and migratory birds.
Swanscombe Skull Site NNR TQ 5979 7429	2 km SW	2.7	An important archaeological site, being the only site in the UK to yield lower Palaeolithic human remains as well as a further 26 extinct mammalian taxa. The site consists of mixed lowland deciduous woodland, scrub, parkland and neutral grassland. This is an important area of greenspace within Swanscombe, providing connectivity to protected species for Greenhithe and the Inner Thames Estuary.
Swanscombe Skull Site SSSI TQ 5972 7429	2 km SW	2.7	An area adjacent to Swanscombe Skull Site NNR and Swanscombe public allotment gardens. Consisting of the habitats mentioned above as well as suitable scrub and hedgerow connectivity – providing important routes for invertebrates/small mammals.
West Thurrock Lagoon & Marshes SSSI TQ 5831 7617	2.5 km NW	66.08	Important site for wintering waders and wildfowl on the Inner Thames Estuary. The combination of extensive intertidal mudflats together with a large and secure high tide roost, attracts waders in nationally important numbers, with significant populations of other bird species. Abundant common reed <i>Phragmites australis</i> and sea club-rush <i>Scirpus maritimus</i> border its south and eastern perimeter where reed warblers, sedge warblers and the notable bearded tit breed. In addition, locally important numbers of teal, snipe and grey heron roost on the shallow waters, grassy islands and lagoon margins. The mudflats form the single largest intertidal feeding area, for wintering waders and wildfowl, on the Inner Thames Estuary. In addition to providing a vital feeding area for the birds which roost on the lagoon, it is also regularly used as a low tide roost by migrant common, black and arctic terns. Stone Ness saltings constitute the largest area of saltmarsh in the Inner Thames Estuary and are characteristically high marshes of low salinity. The vegetation is dominated by sea club-rush, sea aster <i>Aster tripolium</i> and spear-leaved orache <i>Atriplex prostrata</i> .
Globe Pit SSSI TQ 6252 7829	2.8 km NE	0.44	The SSSI is an important site for the interrelationship of archaeology with geology.
Lion Pit SSSI TQ 5978 7811	2.6 km N	2.5	The SSSI exhibits a complex sequence of Pleistocene Thames deposits overlying and banked against Chalk.
Grays Thurrock Chalk Pit SSSI TQ 6092 7890	2.8 km N	17.27	Natural colonisation of the pit bottom has created a range of woodland, scrub and calcareous grassland habitats that are important for the assemblage of invertebrate fauna they support.
Hangman's Wood & Deneholes SSSI TQ 6308 7932	3.8 km NE	3.0	Deneholes SSSI site is a Scheduled Monument. Hangman's Wood Deneholes is the remains of medieval chalk mines and provides the most important underground hibernation site for bats in Essex. Hangman's Wood itself is included within the SSSI, as an area of semi-natural habitat. It is a relict fragment of ancient woodland, dominated by pedunculate oak <i>Quercus robur</i> , ash <i>Fraxinus excelsior</i> and sycamore <i>Acer pseudoplatanus</i> with occasional wild cherry <i>Prunus avium</i> and elm <i>Ulmus sp.</i>
Darenth Wood SSSI TQ 5765 7227	4 km SW	121.79	This site comprises some of the most valuable areas of ancient semi-natural woodland in north-west Kent and includes several rare woodland types. The invertebrate fauna has been exceptionally well studied during the last two centuries and the wood has long been famous as a site supporting many rarities. There are recent records of two nationally rare species and 32 nationally scarce species and historic records of a further 40 Red Data Book species and 200 nationally scarce species



Site Name	Distance and direction from the Site	Area (ha)	Site Description
Purfleet Chalk Pits SSSI TQ 5639 7853	5.5 km NW	10.73	The SSSI is a disused quarry concerned with mid-Pleistocene sand and gravel deposits overlying chalk.
Thames Estuary and Marshes Ramsar site TQ 7182 7718	6.2 km E	5,553	A complex of brackish, floodplain grazing marsh ditches, saline lagoons and intertidal saltmarsh and mudflat. Important site for rare bird species, such as black-tailed godwit, dunlin, red knot. Assemblage of international importance 45,118 waterfowl.
Thames Estuary and Marshes SPA TQ 7257 7802	6.9 km E	4,802	This site encompasses extensive mudflats and small areas of saltmarsh on the south bank of the Thames. Important site for rare bird species, such as black-tailed godwit, dunlin, red knot, grey plover, redshank. Winter waterfowl assemblage 75,019 including the winter species listed above and avocet.

7.2.1.2 Non-statutory Designated Sites

The data search received from KMBRC confirms that there are four non-statutory designated sites within 2 kilometres (1.25 miles) of the Site: three Local Wildlife Sites (LWS) and one country park. Botany Marshes LWS is adjacent to the Site boundary. All sites found within the search radius are described below in detail within **Table 7-1**.

Table 7-1: Non-Statutory sites within a 2-kilometre radius of the Site

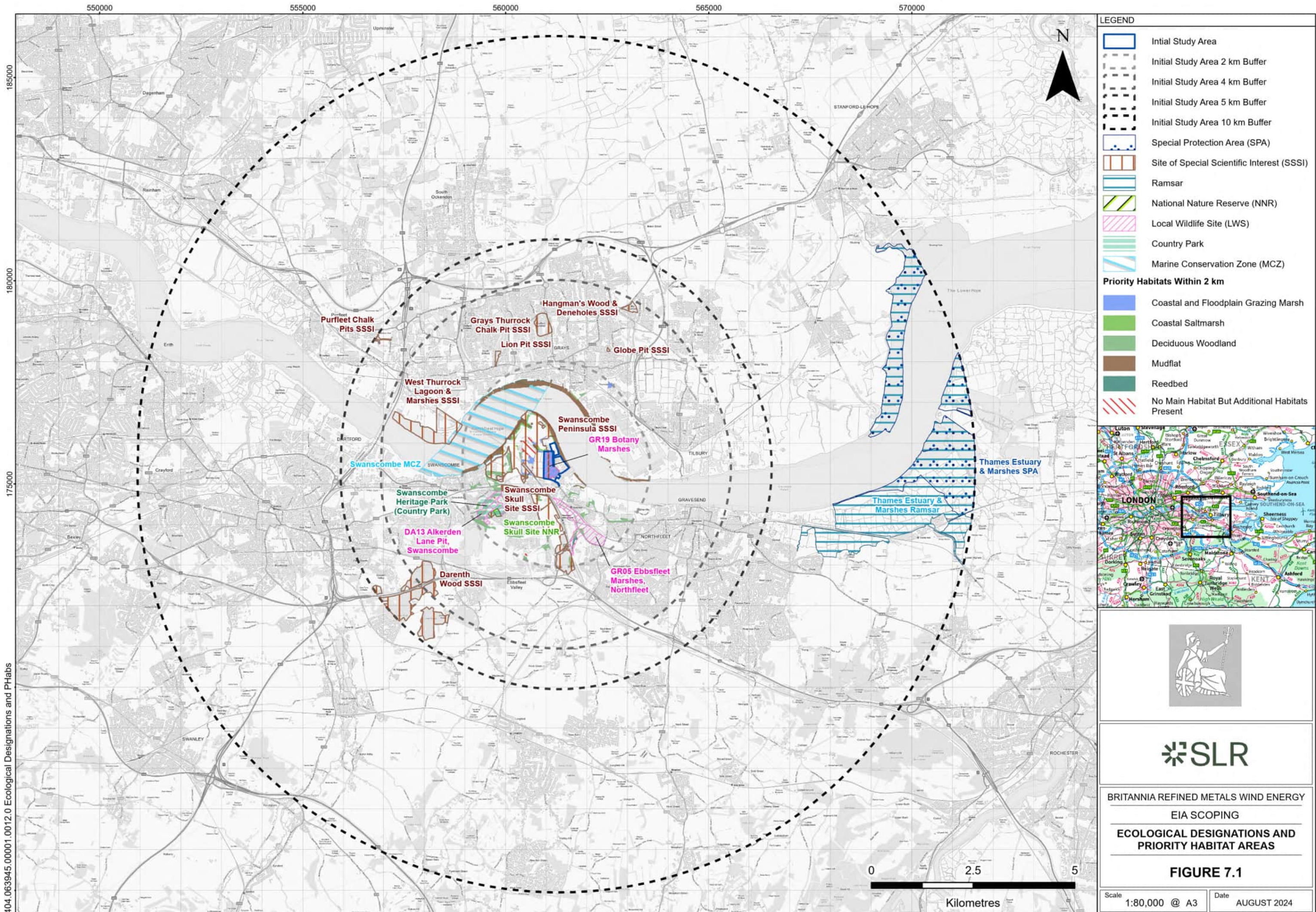
Site Name	Distance and direction from the Site	Area (ha)	Site Description
GR19 Botany Marshes LWS TQ 6119 7531	Adjacent, to the west	18.19	An area of marsh comprising the Swanscombe Peninsula SSSI. It consists of significant areas of wet grassland, reedbed, saltmarsh, exposed mud, standing water, mixed scrub and sheltered riparian habitats.
GR05 Ebbsfleet Marshes, Northfleet LWS TQ 6158 7419	1.1 km SE	39.2	A LWS adjacent to Ebbsfleet International station, consisting of wet grassland, reedbed, marshland, standing water and lowland mixed deciduous woodland.
Swanscombe Heritage Park (Country Park) TQ 5944 7461	1.5 km SW	2.1	A heritage park situated just North of Swanscombe Skull Site which has been designated an SSSI and NNR. It consists of woodland, wood pasture and parkland habitats.
DA13 Alkerden Lane Pit, Swanscombe LWS TQ 5963 7446	1.7 km SW	22.01	LWS surrounding Swanscombe Skull Site nature reserve, consisting of ponds, grassland, reedbeds, mixed scrub and woodland. This site would have potential to support riparian mammals and invertebrate species.

7.2.1.3 Ancient Woodland and Priority Habitats

The KMBRC search and MAGIC confirmed that there are no ancient woodlands within 2 kilometres (1.25 miles) of the Site. The data search confirmed that BAP habitat suitability was present within the search area and several UK BAP priority habitats (as listed by the JNCC, 2008, revised 2011¹²) were present in the vicinity of the Site. These comprised coastal saltmarsh, intertidal mudflats, coastal and floodplain grazing marsh, rivers, reedbeds, lowland mixed deciduous woodland and eutrophic standing water. Further information on

¹² UK Biodiversity Action Plan: Priority Habitat Descriptions (2008, revised 2011) | JNCC Resource Hub





these sites, including the distance to the closest parcel of each priority habitat is provided in **Table 7-3**.

Table 7-3 Priority Habitat within search radius of 2 kilometres (1.25 miles) from the Site¹³

Priority habitat	Closest distance and direction from the Site
Coastal and floodplain grazing marsh	Adjacent, to the west
River Thames	Adjacent, to the east
Mudflats	Adjacent, to the east
Coastal saltmarsh	Eastern edge of the Site and adjacent to the east
Deciduous woodland	730 metres to the west
Reedbeds/swamps	1.6 km to the south

7.2.2 Field Surveys

7.2.2.1 UK Habitat Classification

UK Habitat Classification (UKHab) Survey (UKHab WG, 2020) of the operational parts of the Study Area was undertaken using V2.01¹⁴ on 17 May 2023 and the non-operational parts of the Study Area (i.e. Botany Marshes East) on 6 September 2023. This method was extended to include preliminary checks for notable, protected, or rare species of both flora and fauna.

This level of survey includes the documentation of habitats to a recognised standard, but also includes the recording of field evidence indicating the presence or potential presence of species that could constitute a material consideration in planning terms, such as protected or priority plant or animal species. Notes of principal habitat types, supported by photographs, were made.

Whilst not a full botanical or protected species survey, the method of survey enables experienced ecologists to obtain an understanding of the ecology of a site such that it is possible either to confirm the conservation significance of the site and assess the potential for impacts on habitats/species likely to represent a material consideration in planning terms; or establish the scope and extent of any additional specialist ecological surveys that will be required before such confirmation can be made.

In addition, the presence of plant species included within Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (WCA 1981) was searched for during the survey. Plants included within the schedule are considered derogated pest species that are pernicious or injurious, such as Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandulifera* and giant hogweed *Heracleum mantegazzianum*.

As part of the UKHab survey, the Study Area was assessed for habitats and features with potential to support protected and priority species, together with any field signs of such species including but not limited to, badger *Meles meles*, bats *Chiroptera*, great crested newt (GCN) *Triturus cristatus*, water vole *Arvicola amphibius* and breeding birds *Aves*. This informed the requirements for species-specific survey discussed later in this section of the Request and in Section 12 on ornithology.

¹³ <https://magic.defra.gov.uk/MagicMap.aspx>

¹⁴ The UK Habitat Classification Working Group (July 2023) The UK Habitat Classification User Manual Version 2.01.



During the UKHab survey ground-level assessment of potential bat roosting features (PRFs) in trees and buildings was undertaken based on the Collins 2016¹⁵ Bat Roosting Potential Methodology, which provides criteria for assessing the suitability of structures and trees to support roosting bats.

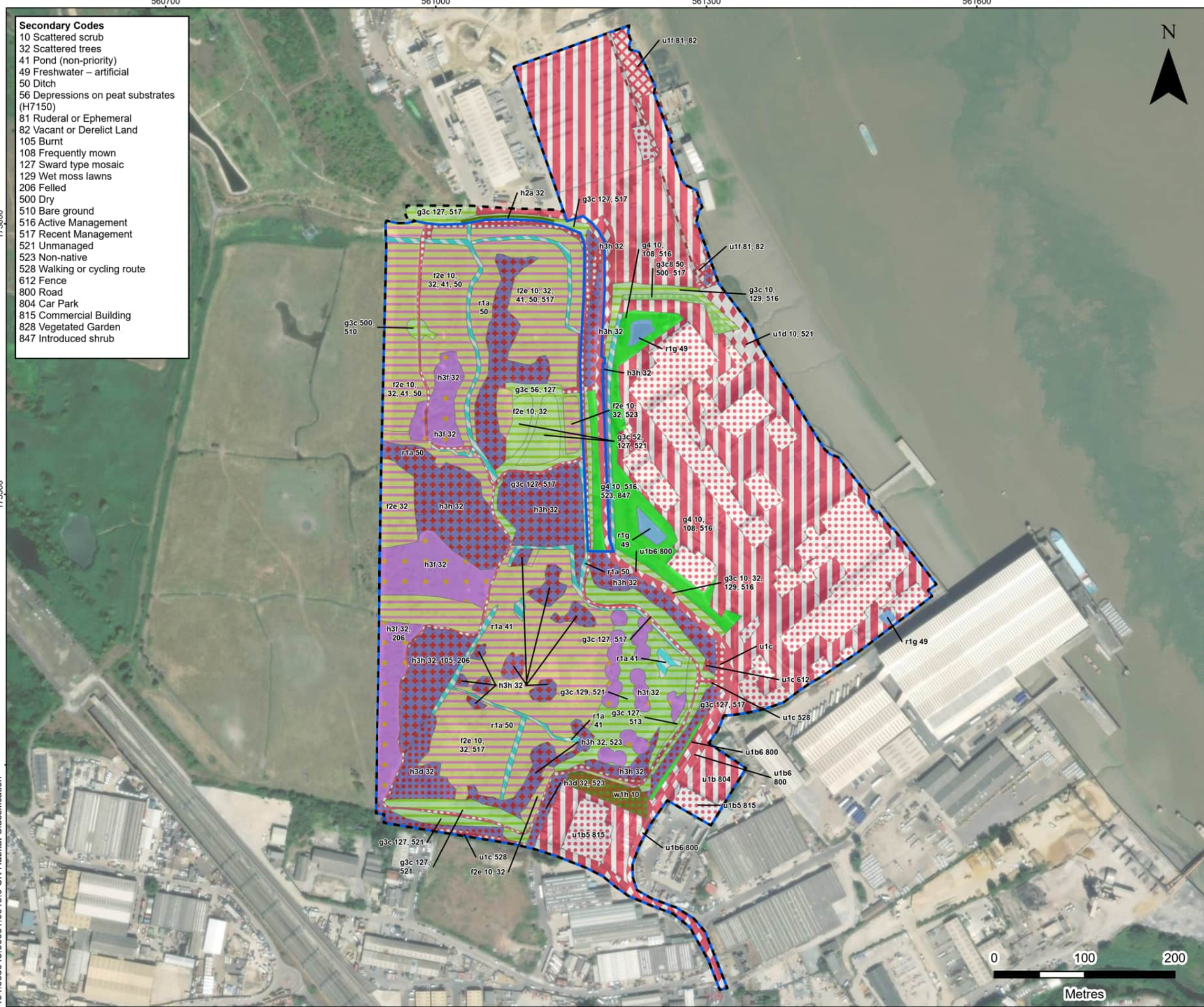
The results of the UKHab Survey for the Study Area are illustrated in map form in **Figure 7.2** and summarised below. **Figure 7.2** has been prepared using the fine scale minimum mapping unit MMU (25 m², 5 metre length), in accordance with the UK Habitat Classification User Manual. In summary, the following habitats were recorded across the Study Area, listed approximately in order of dominance:

- u1b Developed land; sealed surface;
- f2e Reedbeds (10 scattered scrub, 32 scattered trees, 41 pond, non-priority, 50 ditch, 517 recent management);
- u1b5 Buildings (815 commercial building);
- h3h Mixed scrub (32 scattered trees);
- h3h Mixed scrub (32 scattered trees, 41 pond, non-priority, 50 ditch, 517 recent management);
- h3h Mixed scrub (32 scattered trees, 105 burnt, 206 felled);
- h3f Hawthorn scrub (32 scattered trees);
- h3f Hawthorn scrub (32 scattered trees, 206 felled);
- h3d Bramble scrub (32 scattered trees);
- h3d Bramble scrub (32 scattered trees, 523 non-native);
- g3c Other neutral grassland (127 sward type mosaic, 521 unmanaged);
- g3c Other neutral grassland (517 recent management);
- g4 Modified grassland (516 active management, 523 non-native 847 introduced shrub);
- g4 Modified grassland (516 active management);
- w1h Other woodland; mixed (10 scattered scrub);
- h2a Native hedgerow (32 scattered trees);
- f2e Reedbeds (10 scattered scrub, 32 scattered trees, 523 non-native);
- g3c Other neutral grassland (10 scattered scrub, 32 scattered trees, 129 tall or tussocky sward, 516 recent management);
- h3h Mixed scrub (32 scattered trees);
- r1a Eutrophic standing waters (41 Pond, non-priority);
- r1a Eutrophic standing waters (50 Ditch);
- u1b6 Other developed land (800 road);
- u1c Artificial unvegetated, unsealed surface (528 walking or cycling route, 612 fence);
- r1g Other Standing Water (49 Freshwater-artificial);

¹⁵ Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition - Guidance for professionals - Bat Conservation Trust 2016



- Secondary Codes**
- 10 Scattered scrub
 - 32 Scattered trees
 - 41 Pond (non-priority)
 - 49 Freshwater – artificial
 - 50 Ditch
 - 56 Depressions on peat substrates (H7150)
 - 81 Ruderal or Ephemeral
 - 82 Vacant or Derelict Land
 - 105 Burnt
 - 108 Frequently mown
 - 127 Sward type mosaic
 - 129 Wet moss lawns
 - 206 Felled
 - 500 Dry
 - 510 Bare ground
 - 516 Active Management
 - 517 Recent Management
 - 521 Unmanaged
 - 523 Non-native
 - 528 Walking or cycling route
 - 612 Fence
 - 800 Road
 - 804 Car Park
 - 815 Commercial Building
 - 828 Vegetated Garden
 - 847 Introduced shrub



- LEGEND**
- Study Area**
- Study Area
 - Survey Boundary
- Linear Habitat Features**
- u1e - Built Linear Feature
 - h2a - Hedgerow (Priority Habitat)
- UK Habitat Classification**
- f2e - Reedbed
 - g3c - Other Neutral Grassland
 - g3c8 - Holcus-Juncus Neutral Grassland
 - g4 - Modified Grassland
 - h3d - Bramble Scrub
 - h3f - Hawthorn Scrub
 - h3h - Mixed Scrub
 - r1a Eutrophic Standing Water
 - r1g - Other standing Water
 - u1b - Developed Land, Sealed Surface
 - u1b5 - Building
 - u1b6 - Other Developed Land
 - u1c - Artificial Unvegetated Unsealed Surface
 - u1d - Suburban Mosaic of Developed/ Natural Surfaces
 - u1f - Sparsely Vegetated Urban Land
 - w1h - Other Woodland, Mixed
- Note:**
Labels only shown for habitats with Secondary Codes



SLR

BRITANNIA REFINED METALS WIND ENERGY
EIA SCOPING
UK HABITAT CLASSIFICATION

FIGURE 7.2

Scale 1:4,000 @ A3 Date DECEMBER 2024



- g3c8 Holcus-Juncus neutral grassland (50 ditch, 500 dry, 517 recent management); and
- u1d Suburban Mosaic of Developed and Natural Surface (10 scattered scrub, 521 unmanaged).

There were several areas of g3c *Other neutral grassland* within the Study Area, which were similar but differentiated by the management regimes and/or presence of other identifiable features such as tall forbs, sward type, species diversity and bare ground. Therefore, the different areas of g3c *Other neutral grassland* have been differentiated through the use of secondary codes (in brackets) using the relevant other identifiable features. Apart from g3c, the majority of the Study Area consisted of h3f *hawthorn scrub* and f2e *Reedbeds*.

The UK Habitat Classification confirmed that the habitats within the Site comprise predominantly u1b *Developed land; sealed surface* and u1b5 *Buildings*, with the following smaller areas of habitat:

- u1d Suburban Mosaic of Developed and Natural Surface;
- g3c Other neutral grassland;
- g4 Modified grassland;
- h3h Mixed scrub;
- r1g Other Standing Water;
- u1b6 Other developed land (road); and
- u1c Artificial unvegetated, unsealed surface (northern part of the wharf, walking or cycling route, fence).

The areas of g3c *Other neutral grassland* in the central section of the Site are likely to be removed in the future baseline following implementation of the approved E-Scrap facility, with large areas of u1b *Developed land; sealed surface* in this area of the Site replaced by u1b5 *Buildings*.

All areas of proposed infrastructure would be constructed on u1b *Developed land; sealed surface* or u1c *Artificial unvegetated sealed surface*.

Following the findings of the UK Habitat Survey and preparation of a Preliminary Ecological Appraisal (PEA), a suite of species-specific surveys has been commissioned during relevant seasonal periods in 2023 and 2024.

The design evolution for the Proposed Development has located turbines and associated infrastructure on areas of the Site that comprise species-poor previously developed land, however the full extent of baseline ecological assessments undertaken across the Study Area (shown in **Figure 1.1**) have been summarised in the species-specific sections below to provide an understanding of the range of assessments commissioned by the Applicant and the context for the Site (smaller than the Study Area) and its surrounding environment. Where baseline assessments have confirmed that a specific species is unlikely to be affected by the Proposed Development, this stated in the sections below.

7.2.2.2 Bat survey – 2023/24

The PEA undertaken in September 2023, included preliminary methods to assess the suitability of the Study Area for roosting, foraging, and commuting bats. Habitat of moderate suitability for commuting and foraging bats was identified across the Study Area and a bat activity survey was commissioned. The preliminary review included a ground-level assessment of potential roost features (PRFs) in trees and buildings and assessment of suitable habitats for foraging bats and a desk-based study covering protected species. All buildings and accessible trees surveyed had negligible potential to support roosting bats.



Transect and automated bat activity surveys have been undertaken within the Study Area following the methodology set out in *Bats and onshore wind turbines: NatureScot et al. (2019)*¹⁶ has been produced with Natural England (among others) to provide the industry standard guidelines that are applicable across the UK.

Transect routes were walked by a team of two surveyors, starting at sunset and taking 2-3 hours to complete. The survey teams were each equipped with a full spectrum bat detector (Echo Meter Touch) which recorded bat calls, times, and locations. In addition, surveyors made notes of bats observed during the survey, including behaviour seen and direction of flight. Data from the detectors was later subject to analysis to determine species using sound analysis software (Kaleidoscope Pro).

Two automated bat detectors were installed in spring, summer, and autumn at different positions selected to optimise survey effort within Study Area. One detector was installed within the BRM operational area of the Study Area and the other on Botany Marshes East.

Based on data gathered during the field surveys, five bat species and three species groups have been recorded foraging and commuting within the Study Area. The species recorded across the Study Area are listed below:

- Common pipistrelle;
- Soprano pipistrelle;
- Nathusius' pipistrelle;
- Noctule;
- Leisler's bat;
- Myotis species;
- Nyctalus species, and;
- Pipistrelle species.

Overall, bat activity was highest during the spring and summer months with little activity occurring in the autumn period. Important flight lines and foraging areas could not be ascertained given the low number of bat passes recorded during the walked transects.

The following species listed on Schedule 41 of the Natural Environment and Rural Communities (NERC) Act and designated as species of principal importance for the purpose of conserving biodiversity, were detected within the Study Area;

- Soprano pipistrelle – all passes were detected on the Botany Marshes part of the Study Area;
- Noctule – the significant majority of passes were detected on the Botany Marshes part of the Study Area; and
- *Myotis* species – most passes were detected on the Botany Marshes part of the Study Area.

Nathusius' pipistrelle demonstrated the lowest number of passes throughout the Study Area with only one confirmed recording on Botany Marshes during the autumn. However, this record is relevant as Nathusius' pipistrelle are rare and known to migrate from continental Europe to the UK during the autumn. The Study Area is assessed as being of moderate

¹⁶ NatureScot et al. (2019) Bats and onshore wind turbines: survey, assessment, and mitigation (prepared jointly by NatureScot (Scottish Natural Heritage), Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (BCT) with input from other key stakeholders)



value to foraging and commuting bats in the sense that results show an assemblage of at five species.

The assessments commissioned for the Proposed Development are supplemented by previous assessment bat emergence and re-entry surveys / tree roost potential surveys undertaken by Wood Group on behalf of BRM as part of the planning application for the approved E-Scrap facility on the central section of the Site during June and July 2022. The 2022 surveys identified a single common pipistrelle emerging from a building and bat activity by commuting and foraging bats was reported to be low. Common pipistrelles and a single noctule were heard during the tree roost potential surveys.

7.2.2.3 Reptile survey - 2024

Reptile refugia were placed in suitable areas of habitat within the Study Area in April 2024 and surveys undertaken for the presence of reptiles through seven visits between April and June 2024 following the methodology in *Surveying for reptiles. Tips, techniques and skills to help you survey for reptiles* Froglife, (2015). Surveys confirmed the presence of small numbers of common reptiles (grass snake *Natrix natrix*, common lizard *Zootoca vivipara* and slow worm *Anguis fragilis*) within the western areas of the Study Area on Botany Marshes East.

The results of the 2024 survey are reviewed alongside a comparable survey by Wood Group on behalf of BRM as part of the planning application for the approved E-Scrap facility on the central section of the Site during May and June 2022; this survey returned no presence of reptiles within the central section of the Site.

Whilst the Study Area is shown to have low levels of use by common reptile species, it is considered that the habitat within the Site does not provide potential for reptiles.

7.2.2.4 Water vole survey - 2024

An assessment for water vole has been undertaken within the Study Area on two occasions within the active period for this species, in May and July 2024. The assessment followed the methodology set out in the *Water vole Conservation Handbook. Third edition*. Wildlife Conservation Research Unit (2011) and included assessment of water bodies on or within 10 metres of the Study Area to assess the suitability of the habitat for water vole based around key features such as vegetation cover; bank angle and refuge areas. In addition to direct observation of individuals, the survey also included searches for droppings, latrines, footprints, feeding signs and burrows.

Evidence of breeding water vole was confirmed during the May and July 2024 surveys in the form of droppings on two old water vole rafts and feeding signs (fresh cut vegetation). Evidence of water vole was confirmed at two linear watercourse locations on the western side of the Study Area within Botany Marshes East.

A comparable survey undertaken in May and July 2022 by Wood Group on behalf of BRM as part of the planning application for the approved E-Scrap facility on the central section of the Site confirmed habitat suitability for the wet-east ditch through this part of the Site but recorded no conclusive evidence of water vole using this water body.

Whilst the western side of the Study Area on Botany Marshes has confirmed use by breeding water vole, it is considered that the habitat within the Site does not provide potential for this species.



7.2.2.5 Dormouse survey - 2024

Nest tubes were placed in suitable dormouse habitat within the Study Area in April 2024 and monthly surveys have been undertaken to check for the presence of dormouse or signs of presence. At the time of writing (August 2024), no signs of dormouse have been identified. Surveys will continue through to the autumn 2024 to provide survey intensity commensurate with the *Dormouse Conservation Handbook 2nd Edition*, English Nature (2006).

7.2.2.6 Great crested newt (GCN) - 2024

eDNA sampling has been undertaken in May 2024 for five water bodies within the Study Area that presented potential habitat for GCN. Results for all water bodies were negative for the presence of GCN.

The results of the 2024 eDNA sampling are consistent with previous eDNA sampling undertaken in May 2022 by Wood Group on behalf of BRM as part of the planning application for the approved E-Scrap facility on the central section of the Site. The eight suitable water bodies sampled during the 2022 survey all returned negative results.

Surveys undertaken in 2024 and 2022 suggest that water bodies within 500 metres of the Site do not hold potential for GCN.

7.2.2.7 Invertebrate survey – 2024

The survey covered areas of diverse habitats over nine recording days between April and July 2024. The amount of time devoted to any individual area or feature was aimed at sampling the representative habitats and gathering sufficient information to assess the value of the site for its invertebrate assemblages. The eastern side of the Study Area is mainly an urban/industrial area, therefore, because of the poor invertebrate habitats present in this area the invertebrate surveys were concentrated on the western side, within Botany Marshes East where the habitats comprise mixed and scattered scrub dominated by hawthorn *Crateagus monogyna*, extensive common reed *Phragmites australis* reedbeds, a pond, several drainage ditches, modified and neutral grassland, narrow belts of predominately deciduous woodland, and seasonally wet marshy grasslands.

Objectives for the invertebrate survey are summarised as follows:

- undertake a series of site surveys to support an understanding of invertebrate potential and value of the Study Area;
- identify Important Ecological Features (IEFs) for invertebrates;
- make observations and records of invertebrates during the course of the site visits;
- undertake targeted sampling of invertebrate micro-habitats, i.e. areas and features where potential is considered relatively high;
- focus survey effort on species and groups likely to be of particular interest - especially in specific searches for uncommon species for which apparently suitable habitat is present, and groups, such as aquatic/riparian beetles (coleoptera), which are of value in assessment and of potential interest at a landscape scale;
- to identify and list the by-catch of more common species identified during sampling, within the limits of allotted field survey time;
- prepare a full list of invertebrate records made;
- provide brief descriptions and specific habitat requirements of any rare or uncommon species recorded.

The main invertebrate groups included for this survey are:



- Crustacea;
- Araneae – spiders (selected larger species);
- Coleoptera – beetles;
- Diptera – flies (selected families of larger species);
- Hemiptera (Heteroptera) – bugs;
- Hymenoptera – ants, bees and wasps;
- Lepidoptera – butterflies and moths;
- Odonata – dragonflies and damselflies; and
- Orthoptera – grasshoppers and crickets.

7.3 Key Issues and Requirement for Assessment

The established baseline context for terrestrial and aquatic ecology is an important part of the context to the Proposed Development and the evolution of the design for the Proposed Development has sought to minimise the potential for any significant direct effects to either valuable habitats or terrestrial and aquatic species.

The intent of this section of the Scoping Opinion Request is to determine whether individual elements should be included within the ES scope, rather than provide a detailed appraisal of likely impact (this will be provided within the ES).

The assessment will concentrate on the effects of construction, operation and decommissioning of the Proposed Development upon those IEFs, as per CIEEM (2018) guidance) identified during the baseline period. In general, key sensitivities and potential effects are likely to be:

- **sensitive terrestrial habitats** such as Habitats Directive Annex I habitats or SSSIs – effects include direct (e.g., derived from land-take) and indirect (e.g. changes caused by impacts to supporting systems such as groundwater or overland flow), including habitats such as marshland;
- **aquatic habitats** – effects are likely to include ecological impacts of habitat loss / disturbance and changes in water conditions through potential pollution effects;
- **protected / notable species** – impacts considered include direct (i.e., direct mortality; loss of key habitat; displacement from key habitat; barrier effects preventing movement to/from key habitats; and general disturbance) and indirect (i.e., loss/changes of/to food resources; population fragmentation; degradation of key habitat e.g. as a result of pollution); and
- **cumulative effects** – ecological effects arising from the addition of the Proposed Development in combination with other relevant development projects.

Table 7-4: Summary of potential significant effects – Terrestrial and Aquatic Ecology

Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Effects on sensitive terrestrial habitats	High	Small to Negligible	Yes – included
Effects on aquatic habitats	Medium to High	Small to Negligible	Yes - included
Effects on protected and notable species	Low to Medium	Small	Yes - included



Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Cumulative effects on habitats and protected and notable species	Low to High	Small	Yes - included

7.4 Assessment Methodology

7.4.1 Proposed study area extent

The proposed geographic extent of assessment for terrestrial and aquatic ecology will cover direct and indirect effects on the Site; indirect effects on the adjacent habitats within the Study Area and potential effects on the qualifying interest features of the Swanscombe Peninsula SSSI.

7.4.2 Standards and guidance

The principal guidance informing the assessment of terrestrial and aquatic ecological effects within the ES will be:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine*, Chartered Institute of Ecological Management and Assessment (2018 – Updated 2022);
- *Bats and onshore wind turbines: survey, assessment, and mitigation*, NatureScot et al. (2019);
- *Water vole Conservation Handbook. Third edition*. Wildlife Conservation Research Unit (2011);
- *Surveying for reptiles. Tips, techniques and skills to help you survey for reptiles*. Froglife, (2015);
- *Dormouse Conservation Handbook 2nd Edition*, English Nature (2006); and
- *Making Space for Renewable Energy: assessing onshore wind energy development*. NE254 Wind Energy Report, Natural England (2010).

7.4.3 Approach to the baseline assessment

The baseline assessment is well progressed, and the surveys reported in section 7.3 of this Scoping Opinion Request will be completed and reported to inform the assessment of likely significant effects. The emerging results of these assessments have already informed the design review process and location of the proposed wind turbine locations.

7.4.4 Assessment of impact and significance

The ES will include an Ecological Impact Assessment (EcIA). This will consider the potential direct, indirect, and cumulative impacts that the construction, operation and decommissioning of the Proposed Development could have on any IEFs scoped-in to the assessment. The EcIA will be supported by technical appendices covering the baseline assessments undertaken. These will include details of survey methodologies, all survey data and outputs of any analysis.

The assessment method will follow the principles within the CIEEM (2018, updated 2022) guidance.



The assessment will be informed by the description of the Proposed Development within the wider ES and the evaluation for wider countryside interests (i.e., unrelated to any International Statutory Designated sites) will involve the following process:

- identification of the potential ecological effects of the Proposed Development, including both positive and negative;
- considering the likelihood of occurrence of potential effects where appropriate;
- defining the nature conservation value of the ecological features present;
- establishing the feature's conservation status where appropriate;
- establishing the magnitude of change associated with the likely effect (both spatial and temporal);
- based on the above information, making a judgement as to whether or not the resultant effect is significant in terms of the EIA Regulations;
- if a potential effect is determined to be significant, measures to avoid, reduce, mitigate or compensate for the effect are suggested, where required. This would be linked to but separate from statutory requirements for Biodiversity Net Gain;
- considering opportunities for enhancement where appropriate; and
- confirming residual effects after mitigation, compensation or enhancement are considered.

Determination of the level of sensitivity of an IEF is based on a combination of the feature's nature conservation value, defined on the basis of the geographic scale and conservation status, based on its distribution and/or population trend.

The magnitude of potential effects will be identified by considering the degree of change to baseline conditions predicted as a result of the Proposed Development, how IEFs are likely to respond to the Proposed Development, the duration and reversibility of an effect, best practice guidance and legislation, and professional judgement. Effects are judged in terms of magnitude in space and time, and effects can be positive, neutral or negative.

The significance of potential effects is determined by integrating the assessments of IEF sensitivity and magnitude of effect in a reasoned way, based on the available evidence and professional judgement.

A set of pre-defined significance criteria will be used in assessing the potential effects of the Proposed Development to establish whether there will be any effects which will be sufficient to adversely affect the IEF to the extent that its conservation status deteriorates above and beyond that which would be expected should baseline conditions remain (i.e., the 'do nothing' scenario).

7.4.5 Determination of mitigation

Significant effects on ecological features will be avoided or minimised where possible within the design process. Good practice during construction and operation of the Proposed Development will be implemented as standard and implemented through a CEMP, as well as the presence of an Environmental Clerk of Works (EnvCoW) when necessary, during the



construction period. The assessment will be undertaken on the basis that these measures will be in place.

Where likely significant effects on IEFs are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed.

7.5 Summary of the Proposed Methodology

A summary is provided in **Table 7-5** of the proposed geographical scope of assessment, scenarios to be assessed and principal technical guidance applicable to this topic within of the ES.

Table 7-5: Summary of proposed methodology – Terrestrial and Aquatic Ecology

Aspect	Proposed approach
Geographical scope / study area	Assessment of impacts to habitats and species within the Site
	Assessment of impacts to habitats and species within the Study Area
	Assessment of impacts to the qualifying interest features of the Swanscombe Peninsula SSSI
Scenarios to be assessed	2023 and 2024 baseline
	Construction phase impacts
	2031 completed development
Principal technical guidance to inform the assessment within the ES	<i>Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine</i> , Chartered Institute of Ecological Management and Assessment (2018 – Updated 2022)
	<i>Bats and onshore wind turbines: survey, assessment, and mitigation</i> , NatureScot et al. (2019);
	<i>Water vole Conservation Handbook. Third edition</i> . Wildlife Conservation Research Unit (2011);
	<i>Surveying for reptiles. Tips, techniques and skills to help you survey for reptiles</i> . Froglife, (2015);
	<i>Dormouse Conservation Handbook 2nd Edition</i> , English Nature (2006)
	<i>Making Space for Renewable Energy: assessing onshore wind energy development. NE254 Wind Energy Report</i> , Natural England (2010)



8.0 Heritage

8.1 Introduction

Within the context of an EIA, the heritage of an area comprises archaeological sites, Scheduled Monuments, historic buildings, Conservation Areas, Registered Parks and Gardens (RPGs) and other historic environment features. Alongside its inherent values, the 'setting' of an asset may also contribute to its heritage significance.

The heritage impact assessment will: identify heritage assets that may be subject to significant effects, both within the limits of the Proposed Development and within a defined study area; establish the potential for currently unknown archaeological assets to survive buried within the Site; assess the predicted effects on these assets; and propose a programme of mitigation where appropriate. It will consider direct effects (such as physical disturbance), indirect effects (such as impacts from noise), effects on setting, and cumulative effects (where assets affected by the Proposed Development are also likely to be affected by other unrelated development proposals).

The proposed approach to the assessment of effects on cultural heritage is set out within this chapter.

8.2 Known Baseline Conditions

Review of the current heritage baseline has been undertaken through a desk-based assessment using

- Historic England (HE) datasets for all records relating to designated historic assets; and
- the online Exploring Kent's past, Kent Historic Environment Record (HER), for non-designated historic assets.¹⁷

A 2-kilometre Heritage Study Area was considered a suitable initial radius to search for and highlight the presence/absence of assets which could be sensitive to 'setting' change. This Heritage Study Area is used with discretion, with consideration to assets beyond this provided specifically in respect to topographic factors where necessary.

8.2.1.1 Relevant geology

The Site is located on the low-lying southern bank of the Thames Estuary on the Swanscombe Peninsula. The underlying bedrock geology is recorded as undifferentiated Cretaceous chalk of the Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation¹⁸. Superficial deposits within the Site are generally recorded as alluvium by the British Geological Survey (BGS).

As described within Chapter 2 of this Request, previous site-specific ground investigation undertaken as part of a planning application in the central section of the Site confirmed the presence of Made Ground expected to be up to 3 metres thick, which was imported during the 1970s. Underlying the Made Ground the site investigation confirmed approximately 15 to 20 metres of alluvium; 2 to 6 metres of Boyn Hill Gravels; and an upper level of chalk at

¹⁷ Kent Historic Environment Record Exploring Kent's Past Available:
<https://webapps.kent.gov.uk/KCC.ExploringKentsPast.Web.Sites.Public.Default.aspx> [Accessed 03/07/24]

¹⁸ BGS Available: <https://geologyviewer.bgs.ac.uk/>



approximately 21.5 metres below ground level. The depth of chalk extends to over 100 metres thick.

Within the wider area, work undertaken for High Speed 1 and the South Thameside Development Route has identified Pleistocene terraces and Holocene alluvial deposits (dating from the Mesolithic through to the Anglo-Saxon period). There is the potential for such deposits to extend into the Site and a geoarchaeological investigation has previously been undertaken on the Site (adjacent to the proposed location of Turbines B and C) as part of discharge of planning conditions for the approved E-Scrap facility; this is discussed in Section 8.2.1.5 below.

8.2.1.2 Designated Heritage Assets

Designated heritage assets within the 2-kilometre study area are shown on **Figures 2.1 and 2.2**. There are no designated heritage assets within the Site. The general presence/absence of designated assets within the Heritage Study Area is set out below. Reference is also made here to the distance of assets outside of the study area, for due diligence purposes (particularly highly graded assets or those associated with designed views).

- Scheduled Monuments – Palaeolithic sites near Baker's Hole located c.1.1 kilometres (1 mile) south (NHLE: 1003557), Aspdin's kiln located c.700 metres south-east (NHLE: 1004227). and Neolithic sites near Ebbsfleet located c.1.9 kilometres (1.2 miles) south (NHLE: 1004206);
- Grade I Listed Buildings – Parish Church of St Peter and St Paul located c.1.8 kilometres (1.1 miles) south-west and Parish Church of St Botolph located c.1.7 kilometres (1.1 miles) south-east;
- Grade II* Listed Buildings - Former Church of All Saints located c.1.1 kilometres (0.7 miles) south-west, Church of Our Lady of the Assumption located c.1.8 kilometres south-east, the State Cinema located c.1.9 kilometres (1.2 miles) north;
- Grade II Listed Buildings – 22 Listed Buildings recorded within 2 kilometres (1.25 miles). The following assets within closest proximity to the Site includes:
 - Bevan's War Memorial in Northfleet Cement Works, located c.1.2 kilometres (0.75 miles) south-east;
 - Northfleet Lower Lighthouse, located c.1.4 kilometres (0.9 miles) south-east;
- Conservation Areas – The Hill, Northfleet located c.1.6 kilometres (1 mile) south-east and Greenhithe Conservation Area located c.2.5 kilometres (1.6 miles) south-west;
- World Heritage Sites – none within 2 kilometres (1.25 miles) (closest Maritime Greenwich c.21 kilometres (13 miles) west);
- Registered Parks and Gardens – none within 2 kilometres (1.25 miles) (Grade II Belhus Park c.5.6 kilometres (3.5 miles) north-west); and
- Battlefields – none within 2 kilometres (1.25 miles) (Battle of Maldon c.38 kilometres (24 miles) north-east).

8.2.1.3 Non-designated Heritage Assets

Publicly available information regarding heritage assets within the Site was accessed to inform the Scoping Opinion Request¹⁹. The following non-designated heritage assets are recorded within the Site:

¹⁹ <https://webapps.kent.gov.uk/KCC.HeritageMaps.Web.Sites.Public/Default.aspx> [Accessed 03/07/24]



- dredging finds from different periods, from a range of locations (HER reference: TQ 67 SW 1032) – reported to be two fragments of animal bone (Mammoth);
- disused slipway, Broadness (HER reference: TQ 67 NW 1003);
- Onward Cement Works (HER Reference: TQ 67 NW 96);
- Britannia Lead Works (HER Reference: TQ 67 NW 1018);
- Portland Cement Works Docks/Wharves (HER reference: TQ 67 NW 1013); and
- rectangular feature shown on 1st ed OS 6 inch (HER reference: TQ 67 NW 1005) – noted that there was no rectangular feature visible in 2005 as part of the Wessex Archaeology, 2005, *North Kent Coast Rapid Coastal Zone Assessment Survey: Phase II: Field Assessment Year Two Report*.

8.2.1.4 Archaeological Background

This summary provides a general archaeological background to the Site and surrounding area.

- **Prehistoric to Iron Age** - The Swanscombe Peninsula lies within a meander in the Thames Estuary and has been subject to periods of inundation and reclamation from the last ice age through to the medieval period. Human inhabitants have exploited this landscape during the accessible periods. Whilst Palaeolithic finds from dredging are listed on the Site (HER reference: TQ 67 SW 1032). These are reported²⁰ to be dredging finds from the South Coast Dredging Region that were examined at Northfleet Wharf. As such, no accurate location exists for these discoveries and they may have been encountered a substantial distance from the Site during dredging activities, and only examined at Northfleet Wharf. No dredging or works to the river/seabed are proposed as part of the Proposed Development.

Elsewhere beyond the Site boundary, other Palaeolithic find spots are noted including a large Palaeolithic blade recovered to the south of the Site (HER reference: TQ 67 SW 1432) and two Palaeolithic hand axes and one piece of debitage recovered c.770 metres south-west. Further afield, a significant Palaeolithic site was found to contain numerous mammalian fossils and other palaeo-environmental remains c.1.1 kilometres (0.7 miles) south of the Site (NHLE: 1003557).

A Scheduled Neolithic site is noted c.1.9 kilometres (1.2 miles) south of the Site comprising early neolithic pottery and flints with a possible timber trackway (NHLE: 1004206).

- **Roman** - During this period, it is likely that the area of the Site remained as salt marsh. No Roman assets are noted within close proximity to the Site; this is likely due to the ground conditions. During the 1st century AD, Springhead, located c.2.9 kilometres (1.8 miles) south of the Site (NHLE: 1005140), was developed into a major religious centre, which was supported by a Roman town, Vagniacis.
- **Anglo Saxon and Medieval** - During these periods, it is likely that the area of the Site remained as salt marsh, albeit possibly used for seasonal pasture from the medieval period onwards. No Anglo Saxon or medieval assets are recorded within close proximity to the Site; likely due to the ground conditions.
- **Post-Medieval** - Online historic mapping shows the marshland had been reclaimed by the time of the 1839 Northfleet Tithe map, with the Site portioned into areas of

²⁰ <https://webapps.kent.gov.uk/KCC.ExploringKentsPast.Web.Sites.Public/SingleResult.aspx?uid=MKE116005>



pasture. The first edition Ordnance Survey (OS) map of 1869 shows a rectangular feature in the east of the Site, the function of which is unclear (HER reference: TQ 67 NW 1005). By the time of the 1897 OS, the feature is no longer shown, instead a gravel pit is shown in its location. To its south in the south-east of the Site, Portland Cement Works had been constructed (HER reference: TQ 67 NW 1013). By the time of the 1933 OS, Portland Cement Works had been replaced by Britannia Lead Works (HER Reference: TQ 67 NW 1018). The two final HER assets recorded within the Site comprise the Onward Cement Works (HER Reference: TQ 67 NW 96) and a disused slipway (HER reference: TQ 67 NW 1003). The cement works is not shown on the historic mapping but referenced by the HER as being re-used by Britannia Lead Works. It is possible that Onward Cement Works has been mis-recorded and is part of Portland Cement Works. Regarding the disused slipway, there is no date recorded, however it is possibly of modern origin.

- **Undated** - Undated rectangular enclosures are recorded on Botany Marshes to the west of the Site (HER reference: TQ 67 NW 1010). Whilst their origin is unknown, these may date from the post medieval period when this area was reclaimed from the salt marsh.

8.2.1.5 Geoarchaeology

A geoarchaeological assessment was commissioned from MOLA by WSP UK Ltd, on behalf of BRM as part of discharge of planning conditions for the approved BRM E-Scrap facility (Ref: GR/23/376/RVARA (KCC/GR/0042/2024)) and followed on from a deposit model exercise carried out before the site work (MOLA 2023).

Five geoarchaeological boreholes (MOLA_BH01 to MOLA_BH05) were sunk across the approved E-Scrap site, which comprises the central section of the Site and is adjacent to the proposed location of Turbines A and B. The assessment was undertaken in accordance with a Written Scheme of Investigation (WSI) (MOLA 2023) and intact sediment sequences successfully retrieved. The MOLA report on the geoarchaeological evaluation (MOLA, May 2024) summarised the results as follows:

“The primary objective of the evaluation was to determine the nature of the geoarchaeological resource in the area of impact. All five boreholes reached the levels of the Pleistocene sand and gravel deposits which belonged to the Shepperton Gravel Formation. The average surface height of the Pleistocene deposits was -13.30m OD, varying from -15.45m to -10m OD. A plot of the Early Holocene land surface was produced using the surface of the Pleistocene deposits which approximates the topography at the beginning of the Mesolithic. This confirms the topographic trends identified during the previous geomodel (MOLA 2023a), with elevation declining from above -11m OD in the southern portion of the site, to below -13m OD in the central and northern parts of the site.

Overlying the Pleistocene deposits were interbedded Holocene alluvial sediments and peats. The Holocene sequence varied in thickness from 10m to 20m. Local site data (Devoy 1979, 1982; Stastney et al 2021) indicates the Holocene sequence has a moderate to high potential for the preservation of palaeoenvironmental proxy indicators (e.g. pollen, diatoms, plant macrofossils) which can be used to reconstruct past environments. Organic material can also be used for radiocarbon dating which can provide a chronostratigraphic framework for the sequence.

According to the wider landscape modelling, the low-lying topography of the site means that it would have been dry land until the Early Mesolithic because of relative sea level rise affecting the Thames. The site is unlikely to have been permanently settled, and there is a low potential for archaeological remains of medium heritage significance to be preserved within the alluvial peats and clays, such as branch-lain trackways and artefacts associated with riverside activities (e.g. jetties, boats, fish traps).



The Holocene deposits are capped by Made Ground deposits varying in thickness from 0.7m to 5m thick and relate to the development of the site in the late 20th century, therefore being of no archaeological interest.

Although considered deposits of medium heritage significance, given the location of the site near to where Devoy's seminal investigations within the inner Thames estuary took place (Devoy 1979, 1982) and because the planned piling will lead to sediment disturbance or loss, a targeted programme of palaeoenvironmental assessment is recommended to fully answer the research questions. At the request of the Kent County Council Senior Archaeological Officer, this will include post excavation assessment (PXA) of a range of paleoenvironmental proxies and geochemical analyses from three cores to ascertain the survival and quality of the proxies and to assess the history of environmental change on the site. No further fieldwork is required, and as such this report supports the discharge of part (i) of Condition 3. Part (ii) would be discharged on agreement of the results and submission of the PXA and agreement on any final analysis."

8.3 Key Issues and Requirement for Assessment

The intent of this section of the Scoping Opinion Request is to determine whether individual elements should be included within the ES scope, rather than provide a detailed appraisal of likely impact (this will be provided within the ES).

8.3.1.1 Designated Heritage Assets

The Site is located within a wider industrial landscape containing modern tall structures including pylons, cranes and cement works. On the northern side of the Thames Estuary are cranes and wind turbines located at the Port of Tilbury.

There will be no direct effects on any designated heritage assets. For the majority of the designated heritage assets, it is anticipated that due to the distance, intervening buildings, vegetation and/or topography, as well as the nature of the assets, that the Site does not comprise an element of their setting which contributes to their significance. As such, significant harm to these designated heritage assets through setting change is not anticipated. The ES will however consider, assess and report likely effects to designated heritage assets within the Study Area.

The nature of the setting of the Grade II listed Northfleet Lower Lighthouse (NHLE: 1392254) approximately 1.4 kilometres (0.9 miles) to the south-east of the Site will be reviewed within the ES to confirm that no harm to the asset will result from the Proposed Development. The listing description for the asset describes its significance as:

"Northfleet Lower Lighthouse is early amongst comparable wrought-iron framed lighthouses, and is a fine example of this kind of innovative design and construction, few C19 examples of which survive. It is the most structurally complex and visually striking of the remaining River Thames lighthouses, and has an important place in the history of navigation of the river."

It is also noted in the listing that whilst the lighthouse was originally designed to guide vessels around the bend from Gravesend Reach to Northfleet Hope on their way to the Port of London, it was moved 282 metres downstream to its present position in 1968 because of development of the waterfront. As such, whilst its relationship with the Thames remains an important contributor to its significance, it is considered that its original function has been lost through its relocation.



8.3.1.2 Non-Designated Heritage Assets

Information from previous site-specific ground investigation has confirmed the presence of significant depths of Made Ground on the Site. The proposed method of foundation construction (piling) has potential to interact with different archaeological horizons and this ground disturbance within the footprint of the proposed turbines has the potential to result in adverse impacts upon any unknown buried archaeological resource.

Where alluvial deposits are present, these may contain Palaeolithic environmental and material evidence. Such remains could hold archaeological interest informing on the seasonal/marginal activity upon the landscape and potential knapping/working sites or areas of resources within the area. Whilst an indicator of activity, such remains would be unlikely to be considered heritage assets of the highest significance under the terms of the NPPF and would not be anticipated to require preservation in situ.

Any industrial remains that might survive buried within the Site, including any remains of the cement and lead works, would be non-designated heritage assets of comparatively low significance.

8.3.1.3 Geoarchaeology

The results of the 2023 MOLA geoarchaeological evaluation confirmed the potential for piling activities associated with the approved E-Scrap facility to displace Holocene floodplain deposits of high palaeoenvironmental potential and medium heritage significance. Although no further field work was recommended due to the low potential for the preservation of artefactual or structural remains and the significant depth of the Holocene deposits, post-excavation assessment was recommended by KCC and HE, and mitigation would be in the form of any remaining analysis, reporting and archiving.

The Proposed Development will require piling and although the footprint of the area over which piling will be required will be considerably smaller than for the approved E-Scrap facility, the nature and depth of piles may differ. As such, the ES will include assessment of the potential effects of the Proposed Development on geoarchaeology, based on the findings in the 2023 MOLA evaluation.

Table 8-1: Summary of potential significant effects – Heritage

Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Potential direct impact to buried palaeolithic remains	Low to Medium	Small to Medium	Yes – included
Potential direct impact upon buried industrial archaeology	Low to Medium	Small	Yes – included
Potential indirect impact upon designated heritage assets as a result of change to setting.	Medium to High	Negligible to Medium	Yes – included
Potential indirect impact upon non-designated heritage assets as a result of change to setting.	Low to Medium	Negligible to Medium	Yes – included
Potential direct impact on palaeoarchaeological remains	Medium	Small	Yes - included



8.4 Assessment Methodology

8.4.1 Proposed study area extent

There is no guidance defining what the extent of an appropriate 'study area' should be for the archaeological and heritage assessment of wind energy developments. Any given study area will therefore represent an exercise in professional judgment, refined to point of agreement between stakeholders during consultation. The proposed Heritage Study will comprise the Site and 1-kilometre radius for non-designated heritage assets, and then a 2-kilometre radius of the Site for designated heritage assets.

8.4.2 Legislation, standards and guidance

The heritage assessment within the ES will be undertaken in accordance with:

- *Standards and Guidance for Historic Environment Desk-Based Assessment*, Chartered Institute for Archaeologists (2020);
- *The Setting of Heritage Assets Historic England Good Practice Advice Planning Note 3 (Second Edition)*, Historic England (2017);
- *Historic England Advice Note 12 Statements of Heritage Significance*, Historic England (2019);
- *Principles of Cultural Heritage Impact Assessment in the UK*, IEMA, IHBC & ClfA (2021), and
- *Piling and Archaeology: Guidance and Good Practice*, Historic England (2019).

Appropriate reference will be made to the guidance provided within the Historic Environment Planning Practice Guidance (DCLG 2014, updated 2019) and set within the legislative framework provided by:

- the *Planning (Listed Buildings and Conservation Areas) Act 1990*, which provides specific protection for buildings and areas of special architectural or historic interest;
- the *Ancient Monuments and Archaeological Areas Act 1979*, which provides specific protection for monuments of national interest; and
- the *Historic Buildings and Ancient Monuments Act 1953*, which makes provision for the compilation of a register of gardens and other land (parks and gardens, and battlefields).

8.4.3 Approach to the baseline assessment

Based on the results of the baseline study, constraint mapping will be generated using GIS software to show mapped heritage assets in relation to the agreed study area. This will filter out those assets that do not require further assessment. It will also be used to identify and agree the most potentially sensitive assets; these may then require computer-generated visualisations to be produced as part of their assessment, in liaison with consultees.

Consultation will be undertaken with KCC and HE in relation to the method of assessment employed in assessing those heritage assets within their remit; these include Scheduled Monuments, Listed Buildings, and Registered Parks and Gardens. KCC will be consulted in respect of any non-designated assets they consider to be of higher significance.

A targeted site inspection will be carried out in relation to those recorded assets potentially affected by the Proposed Development; the aim of this would be to establish the condition of any recorded assets and identify the potential for any additional presently unrecorded assets. Targeted field inspection of other assets will also be undertaken following a desk-



based comparison of asset mapping with Zone of Theoretical Visibility (ZTV) and satellite imagery; the aim of this would be to identify and inspect any designated heritage assets potentially susceptible to impact as a result of change to setting under the Proposed Development.

Appropriate reference will be made to the ZTVs produced as part of the Landscape and Visual Impact Assessment. ZTV's for maximum tip height and hub height based on bare-earth theoretical visibility (i.e. not taking account of the screening effect of buildings or vegetation) are included as **Figures 10.2** and **10.3** to this Scoping Opinion Request.

The baseline assessment undertaken will be reported within the ES and planning application in the form of a full Historic Environment Desk Based Assessment (HEDBA), undertaken in accordance with the guidelines prepared by the Chartered Institute for Archaeologists and Historic England's setting guidance.

8.4.4 Assessment of impact

Impacts have the potential to be caused by the Proposed Development where it changes the baseline condition of either the asset itself or its setting; it being noted that change does not necessarily result in an impact. In accordance with the EIA Regulations, this assessment will identify impacts and effects as either direct or indirect, adverse or beneficial, and short-term, long-term or permanent. The definition of impact is described below:

- **direct (physical) impacts:** occur where the physical fabric of the asset is removed or damaged, or where it is preserved or conserved, as a direct result of the Proposed Development. Such impacts are most likely to occur during the construction phase and are most likely to be permanent.
- **indirect (physical) impacts:** occur where the fabric of an asset, or buried archaeological remains, is removed or damaged, or where it is preserved or conserved, as an indirect result of the Proposed Development, even though the asset may lie some distance from the Site e.g. through construction. Such impacts are most likely to occur during the construction phase and are most likely to be permanent. By virtue of the location and nature of the Proposed Development, indirect physical impacts are unlikely.
- **setting impacts:** result from the Proposed Development causing change within the setting of a heritage asset that affects its cultural significance or the way in which it is understood, appreciated, and experienced. Such impacts are generally, but not exclusively, visual, occurring directly as a result of the appearance of the Proposed Development in the surroundings of the asset. Setting impacts may also relate to other senses or factors, such as noise, odour or emissions, or historical relationships that do not relate entirely to intervisibility, such as historic patterns of land-use and related historic features. Such impacts may occur at any stage of a development lifespan and may be permanent, reversible, or temporary.
- **cumulative impacts:** can relate to the physical fabric or setting of assets. They may arise as a result of impact interactions, either of different impacts of the Proposed Development itself, or additive impacts resulting from incremental changes caused by the proposal together with other projects already in the planning system or allocated in a Local Development Plan.

Assessment will be undertaken separately for direct impacts and indirect impacts. The magnitude of both beneficial and adverse impact will be assessed according to scale of impact, from very high to neutral/none. The overall significance of effect will cross reference the importance of the asset and the magnitude of impact.



8.4.5 Assessment of significance

The categories of heritage sensitivity / importance to be referred to within the ES are presented in **Table 8-2**. These will act as an aid to consistency in the exercise of professional judgement and provide a degree of transparency for others in evaluating the conclusions drawn.

The categories consider factors such as: designation, status and grading. For non-designated assets, consideration will be given to their inherent heritage interests, intrinsic, contextual, and associative characteristics. In relation to these assets, the assessment will focus upon an assessment of the assets' inherent capability to contribute to understanding of the past; the character of their structural, decorative and field characteristics as informed by the HER and / or site visit observations; the contribution of an asset to their class of monument, or the diminution of that class should an asset be lost; and how a site relates to people, practices, events, and/or historical or social movements. Assessments of the cultural significance of specific assets, where recorded within the HER, will be considered where appropriate.

Table 8-2: Sensitivity/importance of the environment

Receptor sensitivity / importance	Definition
Very High	Very high importance and rarity, international scale and very limited potential for substitution. World Heritage Sites
High	High importance and rarity, national scale, and limited potential for substitution. - Assets described as being of the 'highest significance' within the NPPF (paragraph 213) - Scheduled Monuments - Registered Battlefields - Grade I and II* Listed Buildings - Grade I and II* Registered Parks and Gardens - Conservation Areas including a high number of Grade I and II* Listed Buildings - Non-designated archaeological remains of demonstrable equivalence to a Scheduled Monument
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution. Assets inferred as not being of the highest importance due to their omission from NPPF paragraph 213(b). - Grade II Listed Buildings - Other Conservation Areas - Grade II Registered Parks and Gardens - Archaeological remains contributing to regional research frameworks
Low	Low or medium importance and rarity, local scale - Locally listed buildings - Other archaeological remains
Negligible	Very low importance and rarity, local scale - Assets with little or no surviving archaeological interest - Buildings or urban landscapes of no architectural or historical merit; buildings of an intrusive character



Determining the magnitude of any likely impacts will include consideration of the nature of the activities proposed during the construction and operational phases of the Proposed Development. The changes could potentially include direct change (e.g. ground disturbance), and indirect change (e.g. visible change, noise, vibration, traffic movements affecting the setting of the asset). Impacts may be beneficial or adverse, and may be short term, long term or permanent. The magnitude of any effects will be assessed using professional judgment, with reference to the criteria set out in **Table 8-3**.

Table 8-3: Impact magnitude definitions

Magnitude	Description/reason
Major	Changes to most or all key archaeological materials / historic building elements, such that the resource is totally altered. Comprehensive changes to setting. Severe harm or notable enhancement, such as total loss of significance of the asset or of the integrity of its setting, or exceptional improvement of the cultural heritage significance of the asset and/or the ability to understand, appreciate and experience it.
Moderate	Changes to many key archaeological materials/ historic building elements, such that the resource is totally altered. Considerable changes to setting that affect the character of the asset. Harm or enhancement, such as the introduction or removal of an element that would affect the heritage significance of the asset and the ability to understand, appreciate and experience it to a clearly discernible extent.
Minor	Changes to key archaeological materials/ historic building elements, such that the resource is slightly altered. Slight changes to setting. Harm or enhancement to the asset's heritage significance and/or to the ability to understand, appreciate and experience it to a modest extent, such that the majority of the asset's inherent interests and aspects of setting would be preserved.
Negligible	Very minor changes to key archaeological materials or setting / Slight changes to historic building elements or setting that hardly affect it. The development would not affect the heritage significance of the asset and/or the ability to understand, appreciate and experience it, or would have harmful and enhancing impacts of equal magnitude.
No Change	No change.

Table 8-4 provides a matrix that relates the cultural heritage significance of the asset to the magnitude of impact on its significance, to produce an overall anticipated level of impact. This assessment will be undertaken separately for physical (direct and indirect) impacts and impacts resulting from change to the setting of heritage assets.

It should be noted that a 'significant' impact in EIA terms does not necessarily equate to 'substantial harm' in reference to NPPF terminology. A conclusion on whether or not an impact is considered significant will be made by the author of the ES chapter with regards to a narrative prepared outside of the tabulated summary.



Table 8-4: Matrix to determine heritage effect significance

		Magnitude of change				
		Major	Moderate	Minor	Negligible	No change
Sensitivity/Importance of receptor	Very High	Major	Major	Moderate or Major	Minor	Neutral
	High	Major	Major or Moderate	Minor or Moderate	Minor	Neutral
	Medium	Major or Moderate	Moderate	Minor	Neutral or Minor	Neutral
	Low	Minor or Moderate	Minor	Neutral or Minor	Neutral or Minor	Neutral
	Negligible	Minor	Neutral or Minor	Neutral or Minor	Neutral	Neutral

8.4.6 Determination of mitigation

Where adverse effects on heritage assets are identified, measures to prevent, reduce and/or, where possible, offset these effects, will be proposed. Potential mitigation measures can be discussed in terms of direct, indirect and settings impact. Suitable measures for mitigating direct impacts might include:

- the fencing off or marking out of heritage assets or features in proximity to construction activity in order to avoid disturbance where possible;
- a programme of archaeological work where required, such as an archaeological watching brief during construction activities in or in proximity to areas of



archaeological sensitivity, or excavation and recording where impact is unavoidable; and/or

- a working protocol to be implemented should unrecorded archaeological features be discovered.

8.5 Summary of the Proposed Methodology

A summary is provided in **Table 8-5** of the proposed geographical scope of assessment, scenarios to be assessed and principal technical guidance applicable to this topic within of the ES.

Table 8-5: Summary of proposed methodology – Heritage

Aspect	Proposed approach
Geographical scope / study area	Assessment of changes to known and unknown archaeology and heritage features within the Site
	Assessment of changes to the setting of non-designated heritage assets within a 1-kilometre radius of the Site and designated heritage assets within a 2-kilometre radius of the Site.
Scenarios to be assessed	2025 baseline
	Construction phase impacts
	2031 completed development
Principal technical guidance to inform the assessment within the ES	Standards and Guidance for Historic Environment Desk-Based Assessment, Chartered Institute for Archaeologists (2020);
	The Setting of Heritage Assets Historic England Good Practice Advice Planning Note 3 (Second Edition), Historic England (2017)
	Historic England Advice Note 12 Statements of Heritage Significance, Historic England (2019)
	Principles of Cultural Heritage Impact Assessment in the UK, IEMA, IHBC & ClfA (2021)
	Piling and Archaeology: Guidance and Good Practice, Historic England (2019)
	Historic Environment Planning Practice Guidance (DCLG 2014, updated 2019)



9.0 Ground Conditions and Groundwater

9.1 Introduction

The Site comprises either currently or previously developed land and the Proposed Development will utilise piling for turbine foundation construction. There is thus potential for interaction with any contaminants in the ground or groundwater that may present potential risks to construction workers, watercourses or aquatic ecological receptors.

9.2 Known Baseline Conditions

Desk based assessment in respect of ground conditions and groundwater has been undertaken for the Study Area. To identify the current and historical setting of the Site and its likely environmental sensitivity, reference was made to the purchased Groundsure environmental database²¹ and historical map information as well as freely available online map information obtained from sources including Ordnance Survey (OS), Environment Agency and British Geological Survey (BGS). A summary of the pertinent findings is presented in **Table 9-1**.

Table 9-1: Initial Study Area and Site Setting

Initial Study Area and Site Setting	
Surface Water	Numerous entries relating to “ <i>Inland River not influenced by normal tidal action</i> ” are reported in the western portion of the Study Area within Botany Marshes. The tidal Thames Estuary is located adjacent to the eastern boundary of the Study Area and Site. The Site is located within the Lower Medway Catchment area.
Geology	A review of online BGS map information indicates the following ground conditions: Made Ground is mapped across the majority of the eastern portion of the Study Area but is reported to be absent from the western marshland. Superficial Deposits of Alluvium are mapped across the wider Initial Study Area and are described as comprising clay, silt, sand, and gravel. The underlying Bedrock Geology is recorded as the Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (Undifferentiated) . Historical reports and site-specific ground investigations identify superficial deposits of the Boyn Hill Gravel Formation comprising gravel, occasionally gravelly sand beneath the Alluvium.
Natural Ground Risks	The Groundsure Report lists the following natural ground risks: ● Shrink swell clays – Low; ● Running sands – Moderate; ● Compressible ground – High; ● Collapsible deposits – Very Low; ● Landslides – Very Low; and ● Ground dissolution – Very Low.
Radon	Less than 1%, and as such it is reported that no radon protection measures required.
Groundwater/Aquifer Status	The underlying superficial deposits are designated as a Secondary Undifferentiated Aquifer whereas the underlying bedrock is designated a Principal Aquifer. The northern and western portion of the Study Area is mapped within a Source Protection Zone III (SPZ III), total catchment zone. The southeastern portion of the Study Area is located within an SPZ II, outer catchment zone.

²¹ GroundSure Enviro+Geo Insight Report, EMS-894231_1142162, purchased 14 August 2023



Abstractions	No groundwater abstractions are recorded within the Study Area. The closest active entry relates to a mineral washing process, approximately 140 metres to the north of the Site. The closest potable groundwater abstraction is operated by Thames Water and is situated approximately 1.9 kilometres (1.2 miles) to the south. The only surface water abstraction recorded by the Groundsure Report relates to an active entry for mineral washing purposes located approximately 430 metres southeast.
Unexploded Ordnance (UXO)	Risk mapping identified the Study Area at high risk of UXO and as such previous phases of assessment conducted at the BRM facility were supported by a Pre-Desk Study Assessment (PDSA). The PDSA Report identified WW1 and WW2 strategic targets within 5 kilometres (3.1 miles) of the Site, and that there was a WW2 military camp at Botany Marshes. The Urban District of Northfleet within which the Site is situated recorded 374No. high explosive (HE) bombs with a bombing density of 99.2 bombs per 204ha and that several HE bombs fell close to the Site. Notwithstanding the above, a previously commissioned a UXO survey for BRM indicated that <i>"the risk rating for hand dug and mechanical excavations, and drilling works was classified as low"</i>.
Landfill/Waste Management Sites	No active or recent landfills are mapped within the Study Area although an industrial waste landfill is reported some 190 metres to the northwest. Furthermore, a household, commercial and industrial waste landfill is also located approximately 340 metres south. The northeastern portion of the Study Area is mapped as being part of an historical landfill site that was operated by BRM as an inert and industrial landfill, the license of which was valid between 1977 and 2000. A second historical landfill previously operated by Blue Circle Industries PLC between 1977 and 1992, is also mapped to the immediate north. The Groundsure Report indicates that the western Botany Marshes portion of the Study Area has not been subject to historical landfilling.
Petrol Stations	A single active entry relating to a petrol station approximately 160 metres south on Stonebridge Road is recorded by the Groundsure Report.
EA Recorded Pollution Incidents	Two on-site entries are recorded by the Groundsure Report. The first occurred in 2001 and involved a release of firefighting run off. The second occurred in 2002 and was associated with a release of gas, fuels, and oils. In both instances these incidents were not identified as having a significant impact on land, air, or water quality. Numerous other incidents were identified in the general vicinity of the Study Area, although the only potential significant impact to land occurred as a result of a release of organic chemicals/products some 25 metres to the southwest of the Study Area in 2002.
Historical Land Uses	The numerous entries recorded on or near the Study Area by the Groundsure Report include wharfs, railway/tramway sidings, cement works, unspecified tanks, cement works, paper mills, refuse heap, chalk pit and a tar distillery.
Current Land Uses	The BRM facility is denoted as a metal manufacturing business. Other entries within the Study Area include land uses such as vehicle repair, servicing and testing; vehicle hire and rental (London Bus Company); and marine engineers. Other entries include numerous electricity substations, tanks, and stacks (chimneys).
Environmental Designations	The Botany Marshes portion of the Study Area is denoted as a part of the Swanscombe Peninsula SSSI.

9.2.1 Development History

The earliest published maps dated 1863 to 1865 show the western portion of the Study Area as Botany Marshes. It appears that the various surface water features shown by current mapping are relatively consistent with those present at this time. The remainder of the Study Area appears to be occupied by undeveloped mudflats associated with the tidal Thames Estuary to the north and east. By 1895 a series of structures marked as Portland Cement



works occupy the southeastern corner of the Study Area. An associated area of worked ground is also shown to the immediate north of these works.

Although the Study Area did not undergo significant change, the 1932 series map shows that the configuration of buildings in the southeast had changed, and these were denoted as Britannia Lead Works. By the early 1970s, a series of structures denoted as depots were shown to the immediate north/northeast of the Study Area and by 1977 a series of works buildings were shown in its eastern portion. Although the layout of these buildings was subject to alterations throughout the remainder of the map survey, the general configuration of the Study Area stayed relatively consistent.

9.2.2 Previous ground investigation

A previous ground investigation was undertaken by WSP Ltd in 2023 on behalf of BRM as part of the planning application for the approved E-Scrap facility on the central section of the Site. The intrusive investigation comprised six deep boreholes, six shallow window samples, four trial pits and five hand-dug pits. Boreholes and window samples were installed in the Boyn Hill Gravels, alluvium and Made Ground. Chemical analysis was carried out on soils and groundwater samples, along with ground gas and groundwater level monitoring.

This assessment identified potential contaminants associated with soakaways and septic tanks, Made Ground, former burning grounds and natural soils. Recommendations prior to construction for the approved E-Scrap development included investigation and removal of potential sources of contamination such as septic tanks and historic burning areas, and provision of an appropriate depth of clean cover for landscaped areas.

9.3 Key Issues and Requirement for Assessment

The intent of this section of the Scoping Opinion Request is to determine whether individual elements should be included within the ES scope, rather than provide a detailed appraisal of likely impact (this will be provided within the ES). Based upon the findings of the desk-based study, coupled with understanding of the likely ground conditions present across the Site, as established by previous ground investigations within the Site, a series of Source-Pollutant-Receptor (S-P-R) linkages have been considered, as summarised in **Table 9-2**, which takes account of the following potential sources of contamination:

- **potential Made Ground** – associated with historical phases of redevelopment and historical land reclamation that could be impacted by relatively soluble and immobile contaminants including metals, poly aromatic hydrocarbons (PAH) and asbestos;
- **potentially contaminated landfill materials** – within the Site mapped as a historical “inert and industrial” landfill between 1977 and 2000;
- **spills/leaks of mobile organic contaminants** – including fuels, oils and solvents, originating from the various on and off-site bulk storage tanks that could have impacted soils and shallow/perched groundwater; and
- **potentially hazardous ground gases** - generated by Made Ground soils, landfilled materials, and the natural peaty alluvial deposits.

Potential effects to the following receptor groups / types have been considered:

- **construction workers** – There is potential for construction workers to come in contact with contaminated soils during the construction phase. However, when considering the anticipated nature and extent of Made Ground soils beneath the Site, it is judged that associated risks could be ameliorated using appropriate personal protective equipment (PPE) and health and hygiene practices;
- **future Site users** – The Proposed Development will be surfaced by hardstanding, and this will provide a physical barrier that will prevent future users of the Site being



exposed to any potentially contaminated Made Ground soils. In addition, there would be no envisaged requirement for future users of the Site to interact with the ground or groundwater;

- **neighbouring commercial premises** – Dust could be generated during the construction phase, particularly if the ground is disturbed during periods of dry weather. However, the conceptual risk to human health is relatively low, particularly as there are few potential receptors within likely dust depositions zones from areas of construction and as good practice requires that appropriate dust suppression measures should be implemented regardless of the presence of contamination;
- **gravel and chalk aquifers (and associated SPZ)** – The clayey alluvium is likely to be acting as an aquitard of relatively low permeability that limits significant vertical migration of shallow contaminants. Where deep exploratory holes or piled foundations are utilised, these would have a high potential to forming preferential pathways by which contaminants could migrate to depth and impact the sensitive chalk aquifer;
- **surface water receptors** – Deeper boreholes and/or piles could also create pathways between shallow/perched groundwater within the Made Ground and that in the underlying, relatively permeable Boyn Hill Gravel. This could in turn exacerbate the lateral migration of contaminants resulting in a risk to off-site surface water receptors. The location of the proposed turbines adjacent to the Thames Estuary is expected to limit the additional potential for additional adverse impacts associated with lateral migration of contaminants because if these are present, such lateral migration is likely to be part of the baseline;
- **buried structures and services** - Consideration will need to be given to potentially 'aggressive' ground conditions when selecting an appropriate buried concrete classification. This is relevant to the design of the foundations and is readily mitigated through the specification of concrete; and
- **areas designated for ecological interest** – by virtue of the likely pattern of surface water and groundwater movement in an easterly direction towards the Thames Estuary and the avoidance of any construction activities within the SSSI / LWS on Botany Marshes East, it is not considered likely that there would be potential for significant ground or groundwater effects on national or local ecological designations.

Table 9-2: Summary of potential significant effects – Ground Conditions and Groundwater

Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Effects to construction workers	High	Small	Yes – included
Effects to future Site users	High	Negligible	No – not included
Effects associated with wind-blown contaminants on neighbouring commercial premises	Medium	Negligible	No – not included
Effects on the gravel and chalk aquifers during construction of wind turbine foundations	High to Medium	Medium to Small	Yes – included
Effects to surface water receptors from lateral migration of contaminants associated with the	High to Medium	Small	No – not included



Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
construction of wind turbine foundations			
Effects on buried structures and services	Low	Small	No – not included
Ground and Groundwater effects on national or local ecological designations	High	Negligible	No – not included

9.4 Assessment Methodology

9.4.1 Proposed study area extent

The proposed study area for ground and groundwater effects will be within the Site and a buffer provided by the Study Area (**Figure 1.1**).

9.4.2 Legislation, standards and guidance

Principal relevant legislation and guidance to be used within the assessment of ground conditions and groundwater within the ES will be:

- *Land contamination risk management (LCRM)*, Environment Agency, 2023;
- *Contaminated land exposure assessment (CLEA) tool*, Environment Agency, 2014 (updated 2019);
- Environment Agency Groundwater Protection Guides, March 2017²²;
- *The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015*; and
- *Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015*.

9.4.3 Approach to the baseline assessment

A review will be undertaken to assess likely ground conditions and evaluate the potential presence of significant contaminant sources; the scale of impact the Proposed Development will have in relation to ground conditions, groundwater and contamination and whether these are sufficient to require assessment in the ES due to potential effect on receptors that are likely to include human health; groundwater; surface water and ecology. The review will comprise the following topics:

- preliminary review of publicly available information pertaining to the geology, hydrogeology and hydrology of the Site and surrounding area in the context of land contamination risk;
- review of a Groundsure Enviro & GeoInsight report and a pack of Historical Ordnance Survey Mapping; unless similar information is available in existing information and/or reports on the Site;

²² <https://www.gov.uk/government/collections/groundwater-protection>



- assessment of land use history – review of available historical maps both on-site and off-site to assess the potential for the presence of land uses with a potential legacy of historical contaminant impact;
- collection of information from public registers and regulators – assess information that is available via the GroundSure database;
- review of information pertaining to ground conditions within available site investigation reports; and
- site walkover to observe current site activities, likely ground conditions and discuss current and historical site activities and known information about likely ground conditions with site representatives.

9.4.4 Assessment of impact

The current best practice for the assessment of potentially contaminated sites is detailed by the EA guidance document entitled *Land Contamination Risk Management* (LCRM, 2023), which stipulates that all assessments should be carried out in a tiered approach commencing with a Preliminary Land Quality Risk Assessment (PLQRA). The PLQRA generally comprises a desk-based assessment that utilises information relevant to the current and historical uses of the Site and its surroundings, and whether these could give risk to a potentially significant contamination with the potential to impact human, environmental and built receptors.

LCRM details the following steps for each stage of risk assessment:

- identify the hazard – establish contaminant sources;
- assess the hazard – use a S-P-R linkage approach to find out if there is the potential for unacceptable risk;
- estimate the risk – predict what degree of harm or pollution might result and how likely it is to occur by using the tiered approach to risk assessment; and
- evaluate the risk – decide whether a risk is unacceptable.

The PLQRA will include development of a Preliminary Conceptual Site Model (CSM) through evaluation of the significance of potential S-P-R contaminant linkages in order to develop a summary of ground conditions including geological sequence, land contamination issues and any geotechnical issues relevant. The report will present likely ground conditions and assess potential contamination risks as part of the necessary scope of work to submit a planning application. The report will be included as an appendix to the ES Ground Conditions and Groundwater chapter

9.4.5 Assessment of significance

In common with other technical topic chapters within the ES, the assessment of significance will be based on defined and explained descriptions of receptor sensitivity, magnitude of change (impact) and the resultant significance of effects. These will be described transparently within the ES chapter and the focus of the assessment is expected to be the construction phase of the Proposed Development.

9.4.6 Determination of mitigation

Subject to the findings from the PLQRA, and review of previous ground investigation undertaken on the Site, there may a requirement for further ground investigation and (if necessary) an associated remediation strategy. Potential mitigation is envisaged to include commonly applied PPE for construction workers; appropriate procedures for construction



within a CEMP; and specific considerations for design of wind turbine foundations and the preparation of a Piling Risk Assessment.

9.5 Summary of the Proposed Methodology

A summary is provided in **Table 9-2** of the proposed geographical scope of assessment, scenarios to be assessed and principal technical guidance applicable to this topic within of the ES.

Table 9-2: Summary of proposed methodology – Ground and Groundwater

Aspect	Proposed approach
Geographical scope / study area	Assessment within the Site and buffer provided by the Study Area
Scenarios to be assessed	2025 baseline
	Construction Phase impacts
	2031 completed development
Principal technical guidance to inform the assessment within the ES	<i>Land contamination risk management</i> (LCRM), Environment Agency, 2023
	<i>Contaminated land exposure assessment (CLEA) tool</i> , Environment Agency, 2014 (as updated)
	Environment Agency Groundwater Protection Guides, March 2017
	<i>The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015</i>
	<i>Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015</i>



10.0 Landscape and Visual Impact

10.1 Introduction

This section of the Scoping Report sets out the proposed methodology and approach to be applied in the production of the Landscape and Visual Impact Assessment (LVIA) for the Proposed Development. It also presents the proposed scope of the LVIA in terms of those landscape and visual receptors to be scoped in and scoped out of the assessment process.

A pre-application consultation response from GBC dated 22 April 2024 referenced inclusion of a Seascape Visual Impact Assessment. Consideration of potential effects of the Proposed Development on seascape and how this will be included within the proposed scope of the LVIA is presented within this section of the Scoping Opinion Request.

Justification of the suggested scope is presented through a preliminary assessment of the relevant receptors in respect of their potential to be significantly affected by the Proposed Development.

The purpose of the LVIA is to identify and record the potential effects that the Proposed Development may have on the landscape and visual resource, taking into account effects on:

- the landscape elements of the Site;
- the landscape character of the Site and surrounding area;
- areas that have been designated for their scenic or landscape-related qualities; and
- views from various locations such as settlements, routes, hilltops and other sensitive locations.

The potential cumulative effects that may arise from the addition of the Proposed Development to other wind turbines will also be considered.

The LVIA will consider the potential effects of the Proposed Development during construction, operation and decommissioning development stages. Landscape and visual receptors may or may not be affected at all three development stages.

In this section of the Scoping Report, where distances are referenced in relation to the Proposed Development, these refer to the distance from the nearest turbine, based upon current positions shown on **Figure 3.2**.

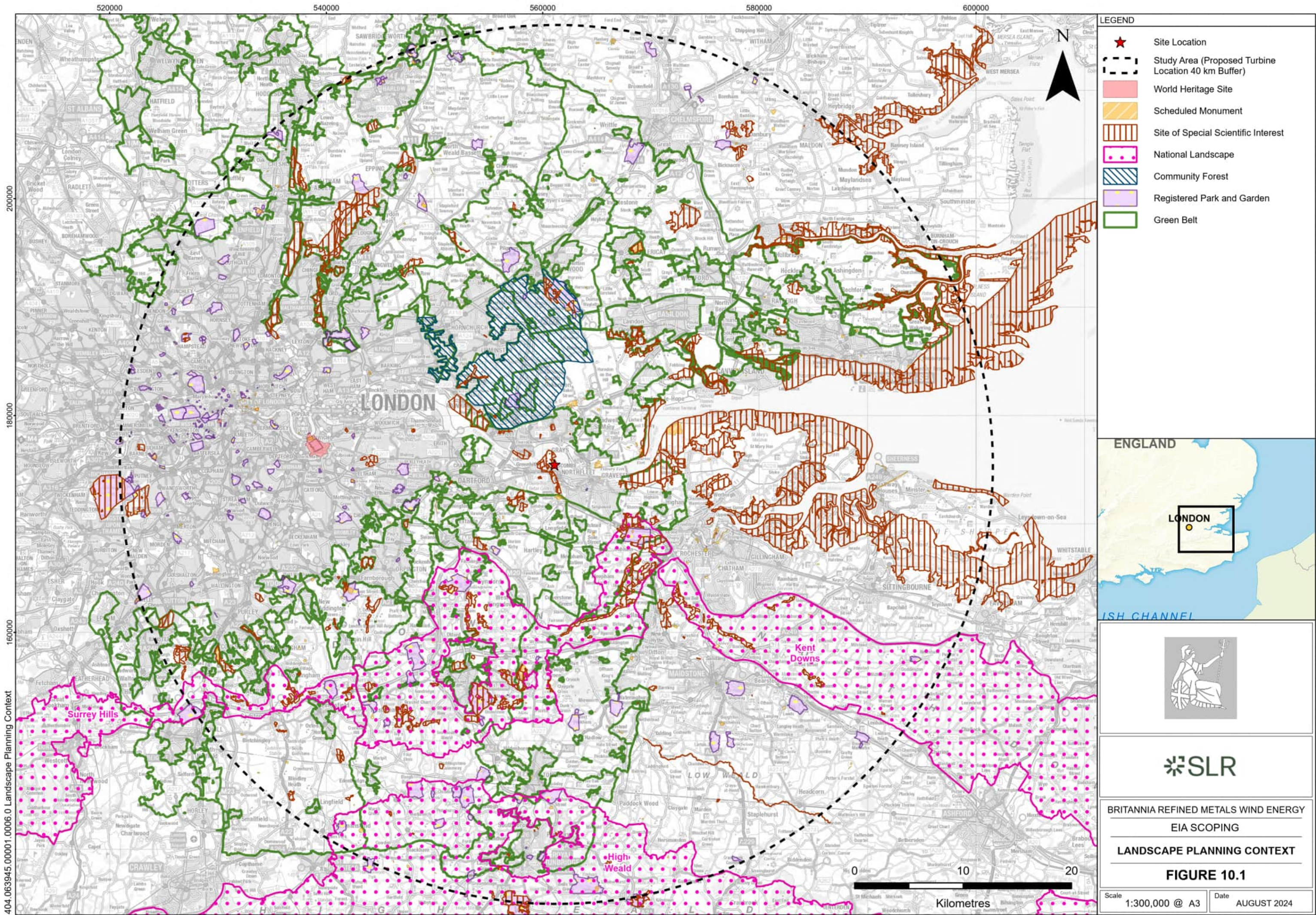
10.2 Known Baseline Conditions

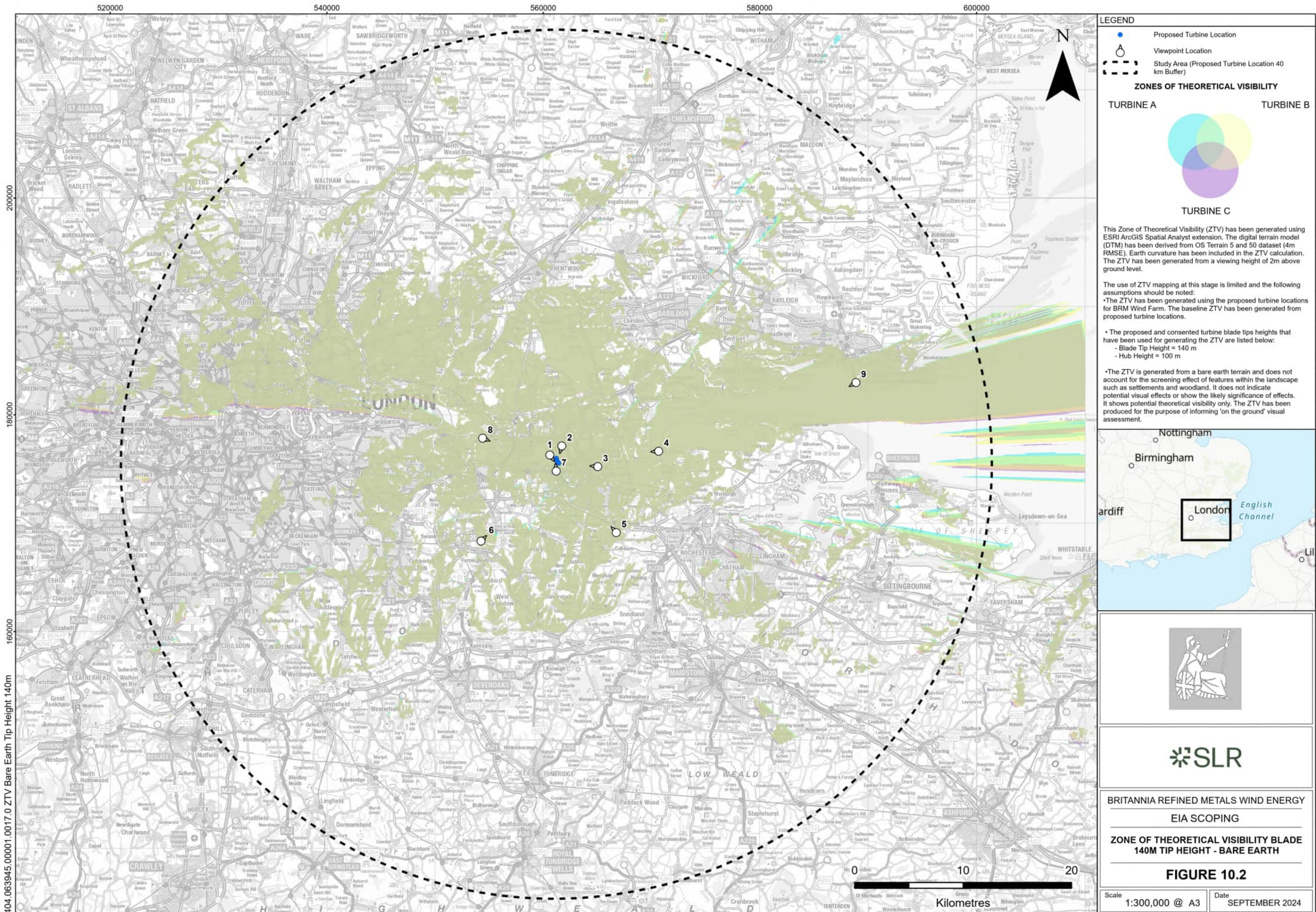
10.2.1 Study Area

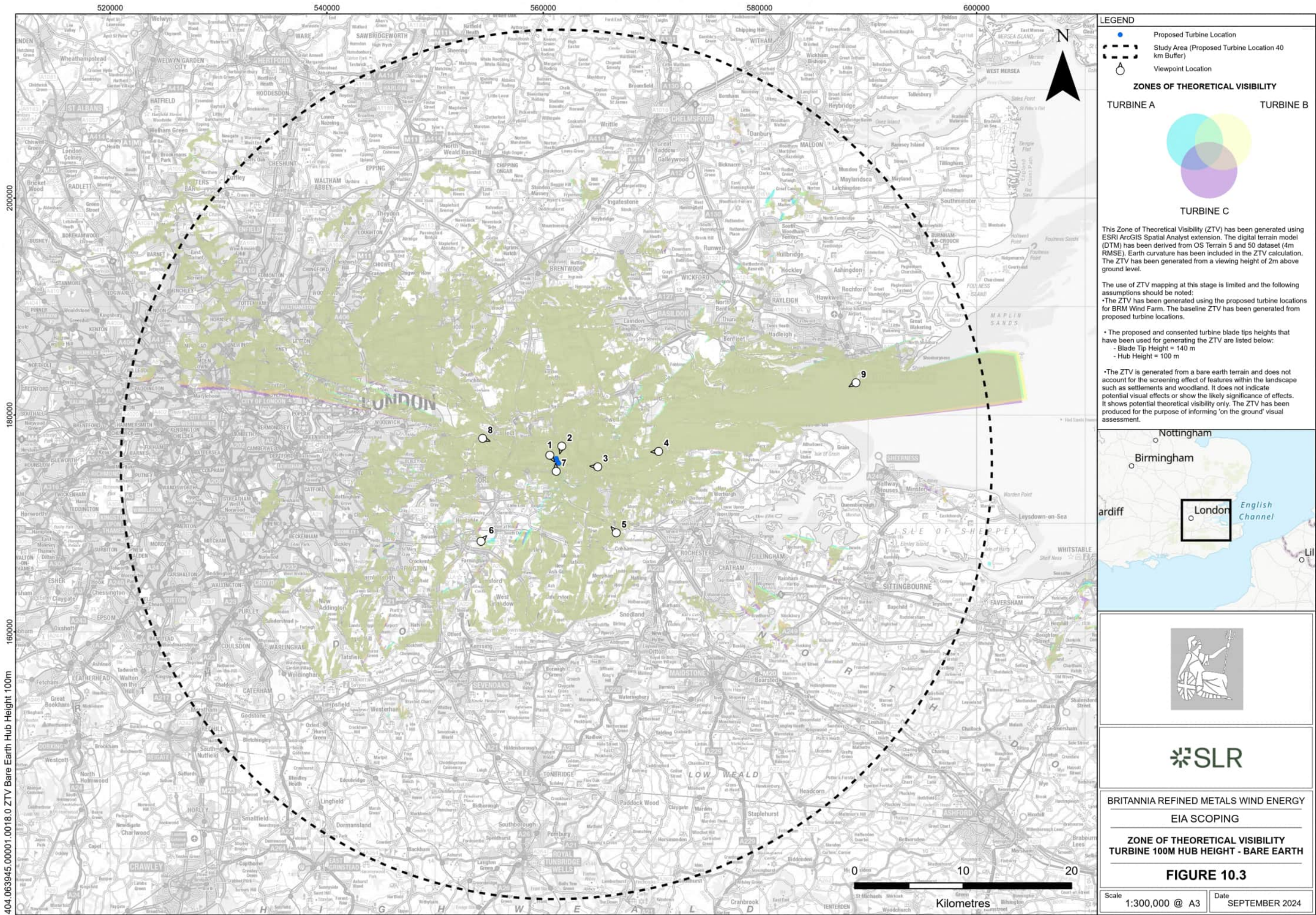
In accordance with the most appropriate guidance for the assessment of onshore wind energy development in England²³, the Study Area for the LVIA of the Proposed Development will cover a radius of 40 kilometres (25 miles) from the nearest turbine, as shown in **Figure 10.1**. This is generally considered to be the maximum radius within which a significant landscape and/or visual effect could arise given the number and height of the turbines that are being considered. Following a review of the initial Zone of Theoretical Visibility (ZTV) (**Figures 10.2 and 10.3**) for the Proposed Development, it is considered that a Detailed Study area with a shorter radius of 10 kilometres (6.3 miles) will be appropriate to identify any potential significant landscape effects. Further justification for this shorter radius is provided in **Section 10.4**.

²³ NatureScot. (2017) Visual Representation of Wind Farms. Version 2.2









10.2.2 Landscape Designations

The Site and its immediate surroundings are not covered by any national or local landscape designations. The closest national landscape designation which is afforded statutory protection is the Kent Downs National Landscape (formerly Area of Outstanding Natural Beauty (AONB)) approximately 8.3 kilometres (5.2 miles) to the south at its closest point. The location and extent of the Kent Downs National Landscape and other landscape or landscape related designations are illustrated in **Figure 10.1** and includes:

- Greenwich Meridian World Heritage Site;
- Kent Downs National Landscape (AONB);
- High Weald National Landscape (AONB);
- Surrey Hills National Landscape (AONB); and
- Thames Chase Community Forest.

Comparing **Figure 10.1** with the Tip Height – Bare Earth ZTV (**Figure 10.2**) indicates that no visibility of the proposed turbines would occur from the Greenwich World Heritage Site or High Weald National Landscape. In addition, visibility would be largely limited to the northernmost edges of the Kent Downs and Surrey Hills National Landscapes

There are also numerous Registered Parks and Gardens (RP&G) within the Study Area. The closest three RP&Gs are Gravesend Cemetery (Grade II*) approximately 3.3 kilometres (2 miles) to the south-east, Belhus Park (Grade II) approximately 5.8 kilometres (3.6 miles) to the north-west and Cobham Hall (Grade II*) approximately 8 kilometres (5 miles) to the south-east. Several of the RP&Gs lie within Central London and would experience no intervisibility with the Site.

Whilst not a landscape designation the Study Area also includes part of the Metropolitan Green Belt. However, no part of the Site lies within the Green Belt.

The Site lies adjacent to the Swanscombe Peninsula SSSI.

The NPPF (December 2024) emphasises the need to ensure a balance is struck in achieving sustainable development whilst protecting and enhancing the '*natural, built and historic* environment'. In terms of designated landscapes great weight is given to conserving and enhancing landscapes and scenic beauty as well as ensuring that development within the setting of national designations is sensitively located and avoids/minimises adverse impacts. Careful consideration would need to be given to the impact the proposed development may have on the setting of national designations within the Study Area as well as their special qualities.

In terms of local planning policy, the Site falls within the GBC Northfleet Embankment and Swanscombe Peninsula East Opportunity Area (Policy CS03). Policy CS03 seeks to promote the delivery of development that benefits existing adjoining residential communities considering environmental improvements and a high standard of design. Assessment of the Proposed Development would also need to give careful consideration to its siting, the number of turbines and mitigation to Policy CS12 Green Infrastructure, which emphasises the need to conserve, restore and enhance overall landscape character and valued landscapes; also reinforced through Policy CS19 Development and Design Principles.

10.2.3 Topography and drainage

The Site lies at an elevation of approximately 3 to 5 metres AOD. Land rises gradually to the south forming a series of ridgelines which includes the edge of the Kent Downs National Landscape at 160 to 200 metres AOD. The Site is adjacent to the Thames Estuary, which is characterised by a mix of intertidal mud flats, low lying marshlands, sand and gravel pits and man-made flood defences alongside prominent fortifications. West of the Site are several



drainage ditches and ponds, which contribute to the marshland character of the Swanscombe Peninsula.

10.2.4 Land use and vegetation pattern

The land use context of the Site is described within Chapter 2 of this Request and is characterised by the combination of industrial and commercial uses to the north and south of the Site; the open grazing marsh, grassland and wetland character of the Swanscombe Peninsula to the west; and the estuary related uses including the Port of Tilbury and London International Cruise Terminal to the east.

Across the wider study area, the landscape character changes from one heavily influenced by industry and urban development more generally and transport corridors (including the M25, M20, A2 and Queen Elizabeth II Bridge / Dartford Crossing) to one which is more rural in character with arable farmland and pockets of woodland.

The landscape is influenced by several vertical structures on either side of the estuary. These include the main BRM stack within the Site, an extensive network of high voltage overhead lines including lattice pylons that cross the Swanscombe Peninsula, on the northern side of the estuary are cranes associated with extensive port facilities, wind turbines at the Port of Tilbury as well as the Queen Elizabeth II Bridge / Dartford Crossing to the west of the Site.

Along either side of the estuary the landscape is perceived to be busy, cluttered and disturbed. This dissipates further east and south moving away from major transport corridors and industrial facilities.

10.2.5 Settlement and Transport Pattern

The nearest current residential properties to the Site are receptors on the northern edge of Northfleet to the east of the junction of Lower Road with the A226 / Stonebridge Road (approximately 600 metres from turbine location A) and to the south of the A226 (approximately 650 metres from turbine location A). The town of Northfleet lies to the south and east of the Site, merging with Gravesend further east, whilst Swanscombe lies to the south-west of the Site. On the northern banks of the estuary are the settlements of Grays and Tilbury.

The outline planning application for Northfleet Harbourside has the potential to change the immediate context of the Site. This proposed development has resolution to grant outline planning permission, and should it be consented and be implemented, it has the potential to introduce a number of residential receptors closer to the Site.

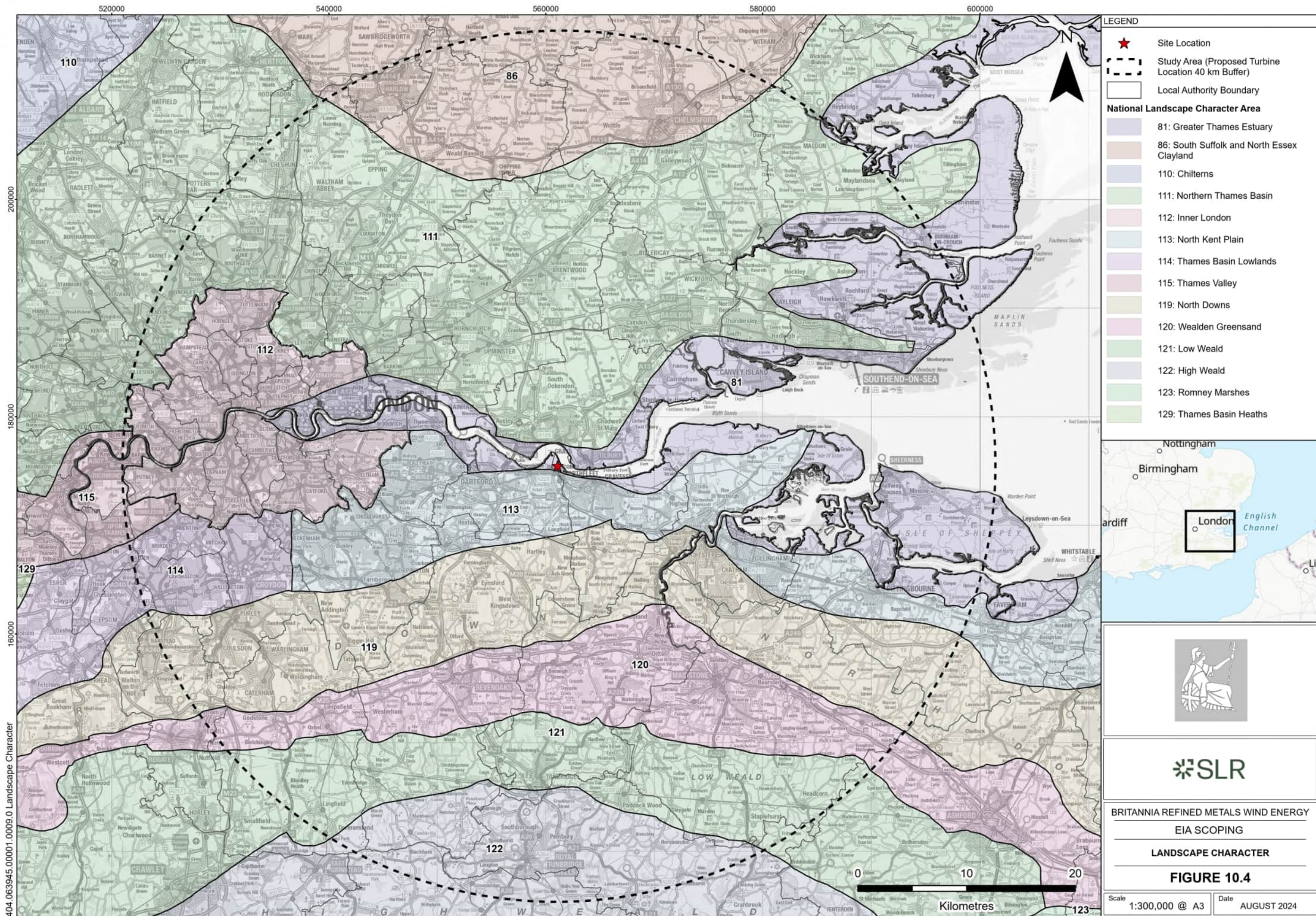
As discussed above, transport corridors have a strong influence on the local landscape. There are also the well trafficked shipping routes along the Thames including cargo vessels and cruise liners to and from the Port of Tilbury. The HS1 railway line bisects part of Swanscombe Marshes before heading into a tunnel and passing under the Thames Estuary; Ebbsfleet International railway station lies to the south-east of the Site. Another main line rail route runs from the Isle of Grain into the centre of London with an east west route north of the Thames from Southend-On-Sea into the centre of London.

10.2.6 Landscape character

The Site lies within National Character Area Profile (NCAP)²⁴ 81 Great Thames Estuary (see **Figure 10.4**). There are the following NCAPs within 10 kilometres (6.3 miles) of the Site:

²⁴ Natural England, 2013 Natural Character Area Profile 81 Greater Thames Estuary. Available from NCA Profile: 81 Greater Thames Estuary - NE473 (naturalengland.org.uk)





- 111 Northern Thames Basin (to the north);
- 113 North Kent Plain (south);
- 119 North Downs (south).

NCAP 81 Great Thames Estuary is characterised by the following:

- *“Predominantly flat, low-lying coastal landscape where extensive open spaces are dominated by the sky, and the pervasive presence of water and numerous coastal estuaries extend the maritime influence far inland;*
- *Open grazing pastures patterned by a network of ancient and modern reed -fringed drainage ditches and dykes, numerous creeks and few hedges or fences, with tree cover a rarity;*
- *Strong feelings of remoteness and wilderness persist on extensive salt marshes, mudflats and reclaimed farmed marshland, which support internationally important plants, invertebrates, and populations of breeding and overwintering birds;*
- *Open mosaic habitats on brownfield sites; and*
- *Highly urbanised areas within London and on marsh edges subject to chaotic activity of various major developments including ports, waste disposal, marine dredging, housing regeneration, mineral extraction, and prominent power stations plus numerous other industry-related activities.”*

At a county level the Site lies either within or adjacent to the Western Thames Marshes based on the Landscape Assessment of Kent, October 2004. The landscape in the published landscape character assessment is described as:

- *“Low lying flat, open marshland, fragmented by built development;*
- *Urban / estuarine context;*
- *River uses;*
- *Remnant grazing marsh and arable farmland; and*
- *Some localised ditches, dykes, wetland and scrub.”*

The published landscape character assessment considered that the landscape condition was very poor, with visual unity significantly interrupted. Landscape sensitivity is moderate; sense of place is weak and visibility high. Landscape actions are to restore and create a framework for remaining areas of marshland and open pasture, creating new reedbeds and salt marsh, developing a design code which respects the inherent landscape conditions, enhancing industrial areas and restoring habitats by sensitive management.

At a Borough level the Site lies adjacent to Landscape Character Area 2 Botany Marshes based on Gravesham Borough Council's Landscape Character Assessment, May 2009. Key characteristics of the Landscape Character Area (LCA) are:

- *“Flat marshland with man-made sea wall on bank of River Thames.*
- *Divided by a network of ditches, meandering waterways and small lagoons into small parcels of land.*
- *Remnant of agricultural land on peninsula.*
- *Limited public access to marshland.*
- *Unified clumps of native vegetation.*
- *Strong network of wildlife corridors within ditches and waterways, mudflat on River Thames provide good habitat opportunities.*



- *Visual detractors including electricity pylons running across marshland and large industrial building on character area boundary.”*

The landscape description on page 21 of the Landscape Character Assessment refers to *“open views across the marshland and towards the River Thames, adjacent industry and towards the Dartford River Crossing Bridge, with the Peninsula location providing panoramic views of the Thames at its tip. Large ships are visible on the river itself and large industry on the Essex side of the river is visible from on top of the flood defence.”*

The published Landscape Character Assessment considered that the landscape is in moderate condition with a *“coherent pattern of elements”* including consistently flat topography, unified clumps of native vegetation and an evident pattern of ditches and waterways. Many visual detractors are apparent including overhead electricity transmission lines and pylons that cross the character area and large industrial buildings on the eastern edge of the LCA.

“The character area has a strong functional integrity heavily influenced by a strong network of wildlife corridors within the ditches and waterways. The mud flats on the edge of the River Thames also provide good habitat opportunities. There are signs of the recent immediate surrounding industry having a negative impact on the marsh and therefore the condition of the area is assessed as being moderate.” (Page 22 of the Landscape Character Assessment)

The published Landscape Character Assessment considered that the LCA is of High sensitivity. Page 22 of the Landscape Character Assessment states that there are few landscape elements to assess. The landscape has *“little established vegetation, no settlements and no roads. It is likely the marshland has remained unchanged for many years. The area is reliant on the Thames flood defence to maintain its existing state and is sensitive to changes in sea level rise and tidal defence management. The ditches and waterways that divide the marsh are distinct and historic and provide a moderate sense of place. As a result of the flat open landscape and limited tree cover the visibility within the marshland is high and causes the area to be visually sensitive to change both within and surrounding the marshland. Heavily influenced by the high visual sensitivity the overall sensitivity of the character area can be assessed as being high.”*

Guidelines within the Landscape Character Assessment for the Botany Marshes are to conserve and restore the landscape. The guidelines state that *“new development should be carefully sited and integrated so that it does not intrude upon areas of tranquil unspoilt marshland or significantly expand or exacerbate existing visual impacts”* alongside resisting *“encroachment from surrounding industrial development.”*

10.2.7 Seascape Character

The seascape character is recorded in the Seascape Character Assessment for the South East Inshore marine plan area²⁵. The 40-kilometre study area is almost entirely contained in one Marine Character Area, namely MCA 18: *Thames and Medway Estuaries*. Very small sections of MCA16: *Swale, Kentish Flats and Margate Sound*, MCA 19: *Essex and South Suffolk Estuaries and Coastal Waters* and MCA 20: *Thames Approaches* are present to the far east of the study area.

MCA 18 includes in part the following descriptions;

“The Thames and Medway Estuaries are the gateway to the busy shipping and transport routes of the Thames, into London and the Medway. Extensive industry and large container ports along the Thames and Medway at Sheerness, Chatham, Thamesport on the Isle of

²⁵ MMO 1134: Seascape Character Assessment for the South East Inshore marine plan area September 2018 (LUC for Marine Management Organisation)



Grain and London Gateway.... The area is of international importance for bird species and large swathes of its semi-natural habitat are designated. The river with its estuaries holds many cultural and historic associations both as a historic transport route and for its military importance, with distinctive landmarks of coastal military heritage along the coast including forts in the lower Thames marshes. The Thames provides a deep and navigable river through London providing the basis for the development of a trading port and foundations of the capital”.

Key characteristics of note include:

- *“The tides fill and empty the meandering creeks across the fringing marshes and mudflats, providing interesting temporal variation. Shingle and shell banks occur in the intertidal zone.*
- *Distinctive landmarks of coastal military heritage including forts at Cliffe, Coalhouse, East Tilbury and Allhallows and at Hoo and Darnet islands.*
- *Entrance to the River Thames heavily used by commercial shipping traffic with oil tankers, container ships, bulk carriers and roll-on/roll-off (ro-ro) ferries, as well as cruise ships, frequently in view.*
- *Southend Pier is a major coastal landmark extending into the Thames Estuary, built in the late 19th century to allow large boats to stop at low tide and attract the tourist trade to the growing seaside resort.*
- *A busy industrial environment with dense residential and large-scale industrial developments including ports, oil refineries and power stations, with vertical cranes forming prominent features. Major ports at Sheerness, Chatham, Grain and Thurrock/Tilbury.*
- *Marked contrast of industrial ports and urban area with the wild and remote isolated low-lying marshy coastal landscape and far-reaching views out across the estuary.”*

10.2.8 Visual receptors

10.2.8.1 Theoretical visibility

The distribution of visual receptors throughout the initial 40-kilometre Study Area is illustrated by **Figure 10.5**, with **Figure 10.6** focusing on potential visual receptors within a 10-kilometre radius of the Site. These figures, alongside the Zone of Theoretical Visibility (ZTV) that have been prepared for the three proposed wind turbine locations (**Figure 10.2: ZTV to Blade Tip Height** and **Figure 10.3: ZTV Hub Height**) have informed the selection of the viewpoints within the assessment to date. The locations of the selected viewpoints are shown on **Figures 10.2** and **10.3**, with details provided in **Table 10-1**.

Table 10-1: Proposed assessment viewpoints

Viewpoint	Grid Reference		Receptor
Viewpoint 1: View from the England Coast Path to the north-west of the Site	560609	176282	Recreational users of the England Coast Path / Kent Coastline Walk and PROW
Viewpoint 2: View from the England Coast Path to the north-east of the Site.	561714	177123	Recreational receptors of the England Coast Path and visitors to Grays Yacht Club
Viewpoint 3: View from the England Coast Path and the edge of Tilbury Fort to the east of the Site	565031	175218	Recreational receptors of the England Coast Path and tourists to Tilbury Fort and Worlds End Pub close to London International Cruise Terminal



Viewpoint	Grid Reference		Receptor
Viewpoint 4: View from the England Coast Path and the edge of Cliffe Fort to the east of the Site	570647	176639	Recreational users of the England Coast Path and Saxon Shore Way. Visitors to Cliffe Fort.
Viewpoint 5: View from Jeskins Country Park to the south-east of the Site	566736	169132	Recreational users and tourists to Jeskins Country Park which lies within the grounds of Owletts; a National Trust property in Cobham and on the edge of the Kent Hills National Landscape and Cobham Hall Registered Park and Garden
Viewpoint 6: View from the edge of Farningham Wood Nature Reserve to the south-west of the Site	554259	168351	Recreational users and visitors to Farningham Wood Nature Reserve and users of PROWs close to the Kent Hills National Landscape which lies south of the M20
Viewpoint 7: View from Phoenix Park to the south of the Site	561199	174804	Residents of Snowden Hill / Phoenix Park off Black Eagle Drive and south of A226 Stoneybridge Road
Viewpoint 8: View from the England Coast Path to the west of the Site	554409	177840	Recreational users of the England Coast Path and PROW
Viewpoint 9: View from the southern end of Southend Pier to the east of the Site	588924	183064	Recreational Visitors to the pier and representative seascape view

The ZTVs show that that the wind turbines would be theoretically visible throughout much of the initial 40-kilometre Study Area, although this would be heavily influenced by surface features, particularly buildings and vegetation. There is little variability in the extent of theoretical visibility associated with each individual wind turbine. The extent of theoretical visibility is largely concentrated within an east-west corridor with greater theoretical visibility along the Thames Estuary and approximately 10 kilometres (6.3 miles) east and west of the Site.

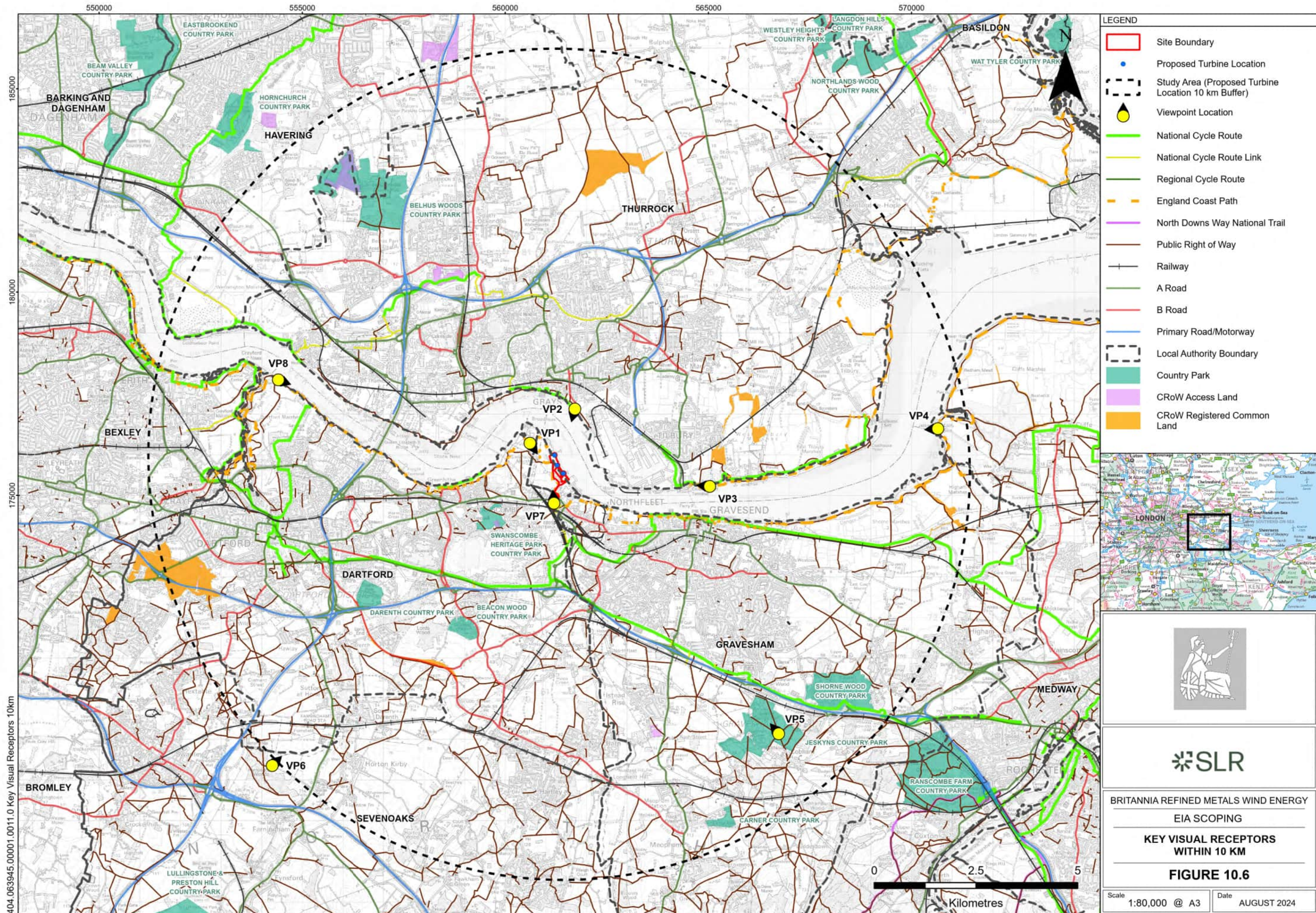
Beyond an approximate 10-kilometre radius of the Site, the extent of theoretical visibility is concentrated to the north facing slopes of rising ground, some of which forms part of the Kent Downs National Landscape to the south, together with lower lying land to the north of the Thames Estuary and south facing rising ground further north.

In terms of landscape designations, there are likely to be views of the Proposed Development from the edge of the Kent Hills National Landscape to the south and Cobham Hall Grade II* Registered Park and Garden to the south-east.

For visual receptors, there may be theoretical views from some settlements throughout much of the Study Area, including Greenhithe, Swanscombe, Northfleet, Gravesend, Grays and Tilbury within a 5-kilometre (3.1 mile) radius. Closer range views and potential effects on visual amenity may be experienced by residents of properties off the A226 close to the Site to the south (at the closest point approximately 600 metres. Recreational receptors will experience sequential transient views, particularly users of the England Coast Path, PROWs and the Thames Estuary.

The diversity and scale of the Study Area means it includes a wide range of visual receptors, which are illustrated by **Figure 10.5** and **10.6**. Key potential receptor groups in the context of this assessment include:





- residents;
- leisure users, including people using Public Rights of Way, CROW / Open Access Land / Common Land, promoted walking and cycling routes including England's Coastal Path and Sustrans National Cycle Routes, National Trust properties and visitors to RP&Gs, Country Parks and visiting marked viewpoints;
- users of transport routes, including the road and rail networks; and
- offshore receptors including users of cruise ships (cruise terminal at the Port of Tilbury), recreational users of small vessels, and cargo ships along the Thames Estuary.

Gravesham Borough Council's Landscape Character Assessment, May 2009 indicates that the visibility of the LCA adjacent to which the Site sits; LCA 2 Botany Marshes is high due to the flat open nature of the marshes with limited tree cover. Guidelines state that *"new development should be carefully sited so that it does not intrude upon areas of tranquil unspoilt marshland or significantly expand or exacerbate existing visual impacts"*.

10.2.8.2 Residential receptors

The settlement pattern is dense to the west around the eastern fringes of London, decreasing in density eastwards and on either side of the Thames. To the south and around the Site, the towns of Dartford, Swanscombe, Northfleet, Gravesend and Rochester are mainly concentrated to the north of the A2 / M2. This gives way to a more dispersed settlement pattern further south where the landscape is more rural with smaller towns and villages together with isolated farmsteads and properties. To the north of the Thames Estuary, the settlements of Grays, Tilbury, Thurrock, Chadwell St Mary and Stanford-le-Hope lie between the A13 and the estuary, with smaller settlements in between. Between surrounding settlements industrial development with extensive warehouses and storage facilities are present, with port facilities being a prominent feature along the Thames Estuary.

The outline planning application for Northfleet Harbourside has the potential to introduce a large number of new residential receptors close to the Site. The potential density of this proposed development and height of the buildings means it is likely that residential properties within this development may have views towards the Site.

10.2.8.3 Leisure receptors

Figures 10.5 and 10.6 show the range of footpaths and bridleways; areas of Access Land and Common Land under the Countryside and Rights of Way Act 2000; and Sustrans cycling routes that provide access to the countryside and edge of the Thames.

Of particular note are the long distance promoted routes which include England's Coastal Path (a National Trail), as well as the Weald Way and Darent Valley Path. These two routes run roughly north-south to the east and west of the Site respectively. In addition, the North Downs Way runs east to west further south, and the Saxon Shore Way extends further east to the north of the Thames Estuary.

There are several cycle routes throughout the Study Area; long distance routes include Sustrans National Cycle Routes 1 (Dover to London), 13 (Tower Bridge to Chelmsford), 177 (Northfleet to Rochester) and 179 (Hoo Peninsular); Sustrans Route 1 forming part of the England Coastal Path.

There are also a number of Country Parks throughout the Study Area, the closest include Swanscombe Heritage Park (approximately 1 kilometre (0.6 miles) from the Site boundary to the south-west), Darent (approximately 4.6 kilometres (2.3 miles) to the south-west) and Beacon Wood (approximately 3.6 kilometres (2.3 miles) to the south-west). There are also several Country Parks in the wider context to the south-east of the Site including Shorne



Wood, Jeskyns, Carner and Ranscombe all either on the edge of or just within the Kent Downs National Landscape. There are also several National Trust properties within the landscape surrounding the Site, particularly to the south.

10.2.8.4 Transport route receptors

There are multiple transport routes across the Study Area. Major routes include the M25 which wraps around the eastern edge of London including the Dartford Tunnel / Crossing. The A2 extends eastwards from the M25, south of the Site, becoming the M2 further to the east. The M20/M26 also radiate out from the M25 further to the south, with the M20 joining the M26 near Borough Green. The A13 extends east from the M25, but the north of the Thames Estuary, to Southend. Other A-roads link with these roughly east-west routes largely running in a north south direction. A series of rail lines cross the Study Area with the closest (HS1) running to the south-west of the Site.

Along either side of the Thames are several ports including the Port of Tilbury. The GBC Landscape Character Assessment (May 2009) states that *“Large ships are visible on the river itself and large industry on the Essex side of the river is visible from on top of the flood defence.”* Recreational users of the Thames Estuary include users of local yacht clubs, sea angling and tourists taking cruise liners to and from the Port of Tilbury.

10.3 Key Issues and Requirement for Assessment

The LVIA is intended to determine the effects that the Proposed Development will have on the landscape and visual resource. Taking account of the known current and likely future baseline; and the scale, nature and location of the Proposed Development, the potential effects on the landscape and visual resource are grouped into seven categories set out below and summarised in **Table 10-2**. The intent of this section of the Scoping Opinion Request is to determine whether individual elements should be included within the ES scope, rather than provide a detailed appraisal of likely impact (this will be provided within the ES).

- **physical effects:** these are restricted to the area within the Site and are the direct effects on the existing fabric of the Site. This category of effects is made up of landscape elements, which are the components of the landscape that may be directly and physically affected by a Proposed Development (e.g. habitats, hedgerows and trees). In the case of the Proposed Development, the nature of the existing land use and limited new infrastructure required (i.e. no new additional track connections) is such that there will be limited material change or loss of existing natural features within the landscape.
- **effects on landscape and seascape character:** landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and the way that this pattern is perceived. Effects on landscape character arise either through the introduction of new elements that physically alter this pattern of elements or through visibility of the Proposed Development that may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape character receptors, which fall into two groups; landscape character areas and landscape-related designated areas.
- **effects on the special qualities of National Landscapes and other landscape designations:** an assessment is carried out to cover the potential for significant effects on the landscape's special qualities.
- **effects on views:** the assessment of the effects on views is an assessment of how the introduction of the Proposed Development will affect views throughout the study



area. The assessment of effects on views is carried out in relation to representative viewpoints and principal visual receptors.

- **effects on views from properties:** Residential Visual Amenity Assessment (RVAA) is carried out for properties within 2 kilometres (1.25 miles) in line with Landscape Institute (LI) technical guidance.
- **effects of turbine lighting:** should visible aviation lighting be required, a nighttime visual impact assessment is prepared to assess the potential visual impact of the turbine lights. Where turbines are proposed at or greater than 150 metres in height there is a requirement for them to have visible red, medium intensity (2,000 candela) lights fitted to the turbine nacelles for aviation safety, in accordance with International Civil Aviation Organisation (ICAO) and CAA guidance. The turbines within the Proposed Development will be below 150 metres in height and as such, it is not envisaged that this lighting will be required.
- **cumulative effects:** cumulative effects arise where the study areas for two or more wind energy developments overlap so that they are experienced at a proximity where they may have a greater incremental effect, or where wind energy developments may combine to have a sequential effect. In accordance with guidance, the LVIA assesses the effect arising from the addition of the Proposed Development to the cumulative situation.

Table 10-2: Summary of potential significant effects – Landscape and Visual Impact

Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Physical effects	Low to Negligible	Small	No – not included
Effects on landscape and seascape character	Low to High	Small to Medium	Yes – included
Effects on the special qualities of National Landscapes and other landscape designations	High	Small	Yes – included
Effects on views	Low to High	Small to Large	Yes – included
Effects on views from properties	High	Small to Medium	Yes – included
Effects of turbine lighting for aviation safety	High	None	No – not included
Cumulative effects	Low to High (as this would consider landscape character and views)	Small to Medium	Yes – included

10.4 Assessment Methodology

The objective of the LVIA is to predict the likely significant effects on the landscape and visual resource. In line with the EIA Regulations, the LVIA effects will be assessed to be either significant or not significant.

The significance of effects is assessed through a combination of two considerations: the sensitivity of the landscape or visual receptor and the magnitude of change that will result from the addition of the Proposed Development. Sensitivity is defined by a combination of



value and susceptibility to the type of development proposed. The magnitude of change is defined by a combination of the size/scale of the proposed development, the geographical extent of the effect and the duration of the effect. These factors are described further in 11.4.4.1 and 11.4.4.2.

The 'nature of effects' relates to whether the effects of the Proposed Development are adverse, neutral or beneficial. Guidance provided in GLVIA3 states that "*thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity*" but does not provide an indication as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and reasoned professional opinion.

10.4.1 Proposed study area extent

Taking account of the preceding baseline analysis and the ZTVs shown as **Figures 10.2 and 10.3**, the proposed study area is focussed on a 10-kilometre radius from the Site, with an additional representative seascape receptor located at the southern end of Southend Pier.

10.4.2 Legislation, standards and guidance

The following guidance, legislation and information sources will be considered when carrying out the **LVIA within the ES**:

- Landscape Institute and Institute of Environmental Management and Assessment. (2013) *Guidelines for Landscape and Visual Impact Assessment*: Third Edition;
- Natural England (2010). *Making space for renewable energy: assessing onshore wind energy development*. NE254 Wind Energy Report
- NatureScot (2017). *Visual Representation of Wind Farms*. Version 2.2;
- NatureScot (2017). *Siting and Designing of Windfarms in the Landscape*: Version 3a;
- NatureScot (2021). *Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments*;
- Landscape Institute (2021). Technical Guidance Note 02/21 *Assessing landscape value outside national designations*;
- Landscape Institute (2019). Technical Guidance Note 06/19 *Visual Representation of Development Proposals*; and
- Landscape Institute (2019). Technical Guidance Note 2/19 *Residential Visual Amenity*.

10.4.3 Approach to the baseline assessment

10.4.3.1 Desk Study

The assessment has been initiated through a desk study of the Site and the study area, which has informed this Scoping Opinion Request. This study has identified aspects of the landscape and visual resource that may need to be considered in the LVIA, including landscape-related planning designations (i.e. National Landscapes), landscape and seascape character typology, operational and potential cumulative energy developments and views from routes (including roads, railway lines, National Cycle Routes, long-distance walking routes and recreational sailing routes), and settlements.

The desk study has also utilised Geographic Information System (GIS) and Resoft Windfarm software to explore the potential visibility of the Proposed Development. The resultant ZTV



diagrams (**Figures 10.2 and 10.3**) provide an indication of which landscape and visual receptors are likely to be key in the assessment.

10.4.3.2 Field Survey

Field surveys will be carried out throughout the study area, although the focus is on the areas shown on the ZTV to gain theoretical visibility of the Proposed Development. The baseline field survey has three broad stages:

- a preliminary familiarisation around the study area in order to visit the aspects of the landscape and visual resource that have been identified through the desk study and verify their existence and importance. Important features and characteristics that have not become apparent through the desk study are also identified, and particularly sensitive receptors are noted in order to inform the design process;
- a visit to the Site, to understand the potential for physical effects, along with any constraints that may restrict the developable area;
- further field survey around the study area, concurrent with the design process for the Proposed Development, to identify those receptors that are likely to be particularly important in the assessment; and
- confirmation and agreement of representative viewpoints to include in the LVIA, including a range of receptors, landscape character, and directions and distances from the Proposed Development.

10.4.4 Assessment of impact

The LVIA will follow a methodology devised specifically for the assessment of wind energy developments and which generally accords GLVIA3, which is the key source of guidance for LVIA. The methodology will be provided in full in the LVIA.

The objective of the assessment of the Proposed Development is to predict the likely significant effects on the landscape and visual resource. In accordance with the EIA Regulations, the LVIA effects are assessed to be either significant or not significant.

In common with the general approach to impact assessment described within Chapter 5 of this Scoping Opinion Request, the significance of effects is assessed through a combination of two considerations; the sensitivity of the landscape receptor or view and the magnitude of change that will result as a consequence of the addition of the Proposed Development.

10.4.4.1 Sensitivity of receptors

The sensitivity of the baseline conditions, including the importance of environmental features on or near to the Proposed Development or the sensitivity of potentially affected receptors, will be assessed in line with best practice guidance, legislation, statutory designations and / or professional judgement. It is established by considering the value of the receptor and its susceptibility to change.

- **resource / receptor value:** For the landscape resource this is related to the value that is attached to different landscapes by society. A landscape may be valued by different people for different reasons. For visual receptors this relates to the recognition attached to a particular view (for example in relation to heritage assets or through planning designations) and indicators of value attached to views by visitors (for example through appearances in guidebooks or on tourist maps and the provision of facilities such as car parking and interpretation). For the purposes of the LVIA a receptor value is classified on a three-point scale of: low, medium, and high.
- **susceptibility to change:** For landscape receptors this means the ability to accommodate the Proposed Development without undue consequences for the



maintenance of the baseline situation and/or achievement of landscape planning policies and strategies. For visual receptors this is a consideration of the susceptibility to the Proposed Development and is a product of the occupation or activity of people experiencing the view and the extent to which their attention or interest may therefore be focused on the views and visual amenity they experience. For the purposes of this LVIA, susceptibility to change is classified on a three-point scale of: low, medium, and high.

10.4.4.2 Magnitude of change

This is gauged by appraising the type and amount of change predicted to occur in relation to the landscape or visual receptor. Factors influencing the magnitude of change include size, scale and nature of change; geographical extent; and duration and reversibility of effect.

- the size and scale of the landscape or visual effect is assessed by consideration of the proportion of elements lost or added, the degree to which aesthetic/perceptual aspects are altered and the effect such changes may have on the receptor.
- the geographical extent of landscape change is assessed by determining the area over which the changes will influence the landscape. For example, this could be at the site level, in the immediate setting of the site, or over some or all of the landscape character types or areas affected. The geographical extent of the visual change identified at representative viewpoints is assessed by reference to a combination of the ZTV, where this has been prepared, field work, and consideration of the relevant criteria; and
- the duration and reversibility of effects on the landscape and/or views are based on the period over which the Proposed Development is likely to exist, and the extent to which the Proposed Development will be removed, and its effects reversed at the end of that period. Duration and reversibility are not incorporated into the overall magnitude of change and may be stated separately in relation to the assessed effects

For the purposes of the LVIA, each of the above three factors is classified on a four-point scale of: negligible, small, medium, and large. Where there is no change to the receptor, or indeed no view of the wind turbines, the magnitude of change is assessed as No Change / None which would result in No Effects.

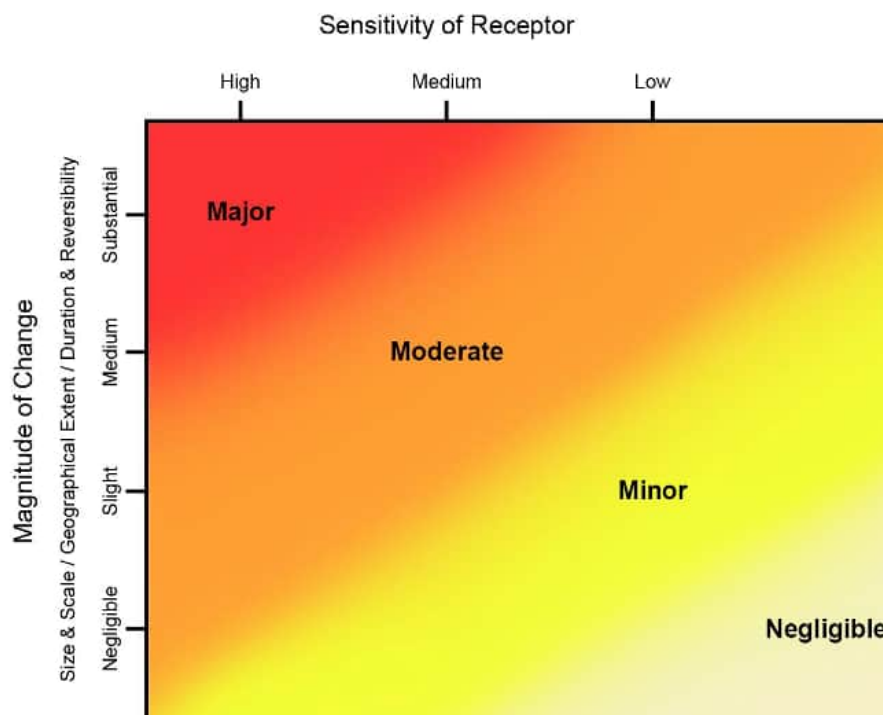
Determination of the assessed magnitude of change for each impact considers the relative influence of each of the above three factors to draw a conclusion on the overall magnitude of change for that impact. To differentiate between the scale used for the three individual contributory factors above, the overall magnitude of change for each impact is classified on a four-point scale of negligible, slight, medium and substantial.

10.4.4.3 Assessment of significance

The sensitivity of the landscape and visual receptor and the magnitude of change that will result from the addition of the Proposed Development will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects. **Image 10-1** summarises guideline criteria for assessing the significance of landscape and visual effects within the ES.



Image 10-1: Significance Matrix for the LVIA



A significant effect occurs where the Proposed Development will provide a defining influence on a landscape element, landscape character receptor or view, albeit that it may be one of a number of defining characteristics. An effect assessed as not being significant occurs where the change associated with the Proposed Development is not material, and the baseline characteristics of the landscape element, landscape character receptor, view or visual receptor continue to provide the definitive influence. In this instance, the Proposed Development may have an influence, but this influence will not be definitive.

Major and Major/Moderate effects will be regarded significant effects in the LVIA and ES chapter. Moderate effects will not be considered significant, although it is possible that a concentration of such effects could be considered to be significant. In accordance with GLVIA3, experienced professional judgement is applied to the assessment of all effects and reasoned justification is presented in respect of the findings where the level of effect is assessed as Moderate.

10.4.5 Assessment of cumulative effect

The assessment of cumulative landscape and visual effects describes the effects arising from the addition of the Proposed Development to a cumulative baseline of operational, under construction, consented and application stage wind energy developments. This approach, whereby existing wind turbines that are part of the current baseline are considered in a cumulative context, is specific to the LVIA and is separate from the traditional cumulative assessment of the Proposed Development with other proposed, approved or in construction developments (as described in Chapter 14 of this Request). This topic-specific approach is set out in the *Assessing the cumulative landscape and visual impact of onshore wind energy developments* (NatureScot 2021) to reflect the nature of the Proposed Development and the specific interaction that multiple wind energy developments can have in some landscapes. Within the ES, it will therefore be presented in addition to the traditional cumulative assessment described within Chapter 14.



It is proposed to restrict the cumulative assessment to wind turbines, given the existing complex urban nature of much of the baseline landscape. In particular the number of vertical features (pylons, cranes, chimneys, towers and engineered structures) already present. The context of other existing large-scale built development will be considered on an ad hoc basis where they form part of the baseline landscape (e.g. Queen Elizabeth II Bridge).

An initial review of the broad wind energy development context within a 60-kilometre (37.5 mile) radius has been undertaken based on the Renewable Energy Planning Database. It is considered that any cumulative landscape effects that would occur, will arise as a result of the pattern of wind energy development within a shorter radius than 60 kilometres (37.5 miles). Known cumulative wind energy developments within a 40-kilometre (25-mile) radius of the Site are shown for scoping purposes in **Table 10-3**.

Table 10-3: Wind energy developments within 40 kilometres of the Site

Development name	Distance and direction from the Site	Status	Scale	Planning Authority
Port of Tilbury	1.2 km east	Operational	12 MW	Thurrock
Little Belhus	7.6 km northwest	Operational	1 MW	Thurrock
Port of Sheerness (formerly Lappel Bank)	29.3 km east	Operational	8.2 MW	Swale Borough
HMP Stanford Hill	37.17 km east	Operational	4.6 MW	Swale Borough
New Rides Wind Farm	38.56 km east	Operational	8.8 MW	Swale Borough
Crossness Sewage Works	13.14 km west	Operational	2.5 MW	London Borough of Bexley
Ford Wind Park, Dagenham	12.38 km northwest	Operational	5.9 MW	London Borough of Barking and Dagenham
Ford Motor Company Ltd (Extension)	13.65 km northwest	Operational	2 MW	London Borough of Barking and Dagenham
Beckton Sewage Treatment Works	18.17 km northwest	Operational	2.2 MW	London Borough of Newham
O2 Arena	22.5 km west (approximately)	Awaiting Construction	3 MW	London Borough of Greenwich

Source: BEIS Renewable Energy Planning Database (<https://data.barbour-abi.com/smart-map/repd/beis/?type=repd>) – accessed July 2024

The closest offshore wind energy developments to the Site are Kentish Flats (90 MW) and Kentish Flats 2 (49.5 MW), which are approximately 53 to 55 kilometres (33 to 34 miles) to the east respectively.

In respect of the Proposed Development, it is envisaged that there would only be notable cumulative interactions with the operational turbines at the Port of Tilbury. While it is also possible that cumulative relationships could arise between the Proposed Development and the three existing wind energy developments on the Isle of Sheppey to the east of the Site (Swale Borough entries in **Table 10-4**), this is not envisaged to represent potential for significant cumulative impact because of the relative distances involved and limited locations where cumulative views would be experienced. There are a number of other smaller wind energy developments to the west of the Site that may also contribute to cumulative effects in combination with the Proposed Development.



Taking this into account and in combination with the ZTV coverage anticipated, it is considered that any significant cumulative effects that would occur would arise as a result of the pattern of development within a 20-kilometre radius, rather than as a result of changes beyond this distance. Combined and sequential cumulative effects would be taken into consideration in the assessment.

It is therefore proposed that a detailed cumulative plan will be produced showing the locations of wind energy developments within 20 kilometres (12.5 miles) of the Proposed Development that are operational, under construction, consented or which are at application stage and where the turbines are greater than 50 metres to blade tip. A 10-kilometre (6.3-mile) radius would be shown for each cumulative site to identify potential areas of overlap where cumulative effects are most likely to determine cumulative viewpoint positions. Sites that lie beyond a 20-kilometre (12.5-mile) radius of the Proposed Development in their entirety will be discounted due to their distance from the Proposed Development and the reduction in likely effects as a result of the local topography and extent of existing large-scale urban development. GBC and Natural England will be consulted over the final list of developments to be considered within the cumulative assessment.

10.5 Summary of the Proposed Methodology

A summary is provided in **Table 10-4** of the proposed geographical scope of assessment, scenarios to be assessed and principal technical guidance applicable to this topic within the ES.

Table 10-4: Summary of proposed methodology – Landscape and Visual Impact

Aspect	Proposed approach
Geographical scope / study area	Assessment of changes to landscape features and character within the Site.
	Assessment of changes to landscape character and visual impact focussed on a 10-kilometre radius of the Site, with an additional representative seascape receptor at the southern end of Southend Pier.
	Assessment of cumulative changes to landscape character and visual impact focussed on a 20-kilometre radius of the Site.
Scenarios to be assessed	2025 baseline
	Construction phase impacts
	2031 completed development
Principal technical guidance to inform the assessment within the ES	<i>Guidelines for Landscape and Visual Impact Assessment: Third Edition</i> , Landscape Institute and Institute of Environmental Management and Assessment. (2013)
	<i>Making Space for Renewable Energy: assessing onshore wind energy development. NE254 Wind Energy Report</i> , Natural England (2010)
	<i>Visual Representation of Wind Farms</i> . Version 2.2, NatureScot (2017).
	<i>Siting and Designing of Windfarms in the Landscape</i> : Version 3a, NatureScot (2017).
	<i>Guidance for Assessing the Effects on Special Landscape Qualities</i> (Working Draft 11), NatureScot (2018).
	<i>Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments</i> , NatureScot (2021)
	<i>Technical Guidance Note 02/21 Assessing landscape value outside national designations</i> , Landscape Institute (2021).
	<i>Technical Guidance Note 06/19 Visual Representation of Development Proposals</i> , Landscape Institute (2019).
	<i>Technical Guidance Note 2/19 Residential Visual Amenity</i> , Landscape Institute (2019).



11.0 Noise

11.1 Introduction

Noise will be generated by the Proposed Development during the construction, operational, and decommissioning phases. This chapter of the Scoping Opinion Request outlines the proposed scope of work required to assess the potential significant effects associated with noise from the Proposed Development. The effects will be assessed at agreed representative receptor locations in the vicinity of the Proposed Development by comparing predicted noise levels arising with the relevant noise limits from industry guidance.

11.2 Known Baseline Conditions

The main sources of noise in the existing environment at dwellings in proximity to the Site are anticipated to be:

- local traffic movements;
- noise associated with industrial and commercial activities;
- noise from shipping and other vessels on the Thames Estuary;
- wind induced from trees and foliage surrounding each dwelling;
- localised sources from human activities;
- birdsong and animal activity; and
- noise from operational wind turbines at the Port of Tilbury (although this is not considered part of the baseline when deriving operational noise limits).

A desk-based review has been made of publicly available noise survey data captured on Lower Road, to the south of the Site (London Resort Company Holdings, 2020). This data was captured at a wind speed of no more than 5m/s, as per the traditional (non-wind turbine related) noise survey requirements to the relevant UK standards and guidance. However, if wind speeds were to increase, background sound levels could be expected to increase slightly in turn.

The findings of these prior surveys indicate background sound levels in the vicinity of the Site of 42-45dB L_{A90} daytime. It is anticipated that the daytime background sound levels in the vicinity of the A226, where the closest current residential receptors are located, will not be dissimilar, and potentially higher, due to the amount of vehicle noise and the proximity to rail traffic located to the west, as well as the Kuflink Stadium to the south.

Further research in relation to existing noise climate was sourced from the 2008 noise impact assessment associated with the operational Port of Tilbury Wind Energy development. Background sound levels in Gravesend of 48dB L_{A90} were recorded during the daytime, and 51dB L_{A90} during the night. These levels were captured south of the Site (Factory Road, Burch Road, Crawley Court, West Street), however, they present an informative baseline because levels were noted to be broadly consistent across Gravesend over the diurnal cycle for the selected survey locations.

Although noting that the Port of Tilbury data is from 2008, the wind data included in its noise impact assessment suggests there is limited correlation between wind speed and noise data, which is noted as common for urban environments where existing noise levels are controlled more strongly by other sources such as industrial and commercial uses and existing road traffic.

The desk-based baseline assessment will be extended within the ES chapter to include background sound level measurements carried out at a number of properties or



representative locations within the vicinity of the Proposed Development to determine appropriate operational noise limits. The scope of such measurements will be discussed with GBC and further information on the proposed scope of the baseline assessment is provided at Section 11.4 below.

11.3 Key Issues and Requirement for Assessment

The intent of this section of the Scoping Opinion Request is to determine whether individual elements should be included within the ES scope, rather than provide a detailed appraisal of likely impact (this will be provided within the ES).

Noise and vibration will be generated during construction, including from the following activities:

- delivery of wind turbine components and construction materials to the Site;
- construction of foundations by piling;
- turbine erection; and
- other on-site construction, e.g., substation.

During the operational phase of the Proposed Development the principal noise effects will be from the wind turbines as they rotate to generate electrical power. Such noise is usually characterised as broadband aerodynamic noise. Other potential sources of noise during the operational phase are noise from infrequent turbine maintenance and maintenance vehicles accessing the Site, and noise from other on-site ancillaries such as the substation. No likely significant impacts are anticipated from these ancillary elements, which will be scoped out of the ES.

Noise during the decommissioning phase may be associated with the dismantling of the wind turbines, the breakup of any foundations (if not left in-situ), removal of other infrastructure as deemed necessary, and decommissioning vehicles accessing the Site. Maximum potential noise and vibration impacts during the decommissioning phase are likely to be similar to, or lower than the maximum potential noise and vibration impacts arising during the construction phase of the Proposed Development and hence would be expected to be scoped out of further assessment in the ES chapter.

Potential significant effects, and hence topics proposed for inclusion within the scope of the ES are set out in **Table 11-1**. Residential receptors are all considered to be of 'high' sensitivity to change.

Table 11-1: Summary of potential significant effects – Noise

Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Noise associated with delivery of wind turbine components and construction materials to the Site	High	Small	Yes – included
Construction noise associated with creation of wind turbine foundations	High	Small	Yes – included
Construction vibration associated with creation of wind turbine foundations	High	Small	Yes – included



Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Effects of noise associated with wind turbine installation	High	Small	Yes – included
Effect of operational noise from the proposed wind turbines	High	Small to Medium	Yes – included
Cumulative effect of operational noise from the Proposed Development with operation noise from the Port of Tilbury wind turbines	High	Small to Medium	Yes – included

11.4 Assessment Methodology

11.4.1 Proposed study area extent

The proposed study areas differ for construction and operational noise, although the nearest Noise Sensitive Receptors (NSR) considered in the operational noise impact assessment are likely to be the receptors that will be considered for construction noise. NSRs for the purposes of the noise impact assessment within the ES will be defined as residential receptor locations in the vicinity of the Proposed Development. Noise limits for construction and operational noise will apply at residential receptor locations, with initial NSRs set out in **Table 11-2**. If construction noise impacts are acceptable at the nearest noise sensitive receptors, it can be inferred that they will be acceptable at all other receptors.

11.4.2 Legislation, standards and guidance

Principal guidance to be used within the assessment is set out below:

- *Planning Practice Guidance: Noise*, Department for Levelling Up, Housing and Communities (DCLG) (2015);
- *Assessment and Rating of Noise from Wind Farms (ETSU-R-97)*, Working Group on Noise from Wind Turbines (1996);
- *A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise*, Institute of Acoustics (2013);
- *Attenuation of sound during propagation outdoors. Part 2: General method of calculation ISO 9613-2:1996*. International Organisation for Standardisation (ISO) (1996);
- BS5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*, British Standards Institution (2014); and
- *LA111 Noise and Vibration Revision 2*, Design Manual for Roads and Bridges (2020).

ETSU-R-97 is endorsed by United Kingdom (UK) national planning policy (DECC, 2011; DCLG, 2015) as the appropriate guidance document for the assessment of the impacts of noise generated by wind turbines.

The Institute of Acoustics (IOA) Good Practice Guide to the Application of ETSU-R-97 provides guidance on noise assessment of wind turbines above 50kW, reflecting the original principles within ETSU-R-97. The IOA GPG does not replace the limits within ETSU-R-97; it provides guidance on good practice for the use of ETSU-R-97, and on the prediction of wind turbine noise.



11.4.3 Approach to the baseline assessment

For a greater understanding of the noise baseline and to provide a basis of comparison for impact assessment, it is proposed that a proportionate baseline noise survey will be undertaken at the identified NSRs, and any other receptors deemed sensitive upon investigation/consultation.

The specific scope of the baseline noise survey will be agreed through liaison with GBC regarding the Proposed Development and the arrangement of access, typically supported by the LPA's Environmental Health Officer (EHO), to appropriate locations (e.g. gardens or adjacent amenity spaces) associated with the NSR properties. Occasionally, a proxy measurement location such as a willing commercial property can be agreed in consultation if access is not provided by residential property owners.

Likely NSRs have been considered through desk-based assessment and the provisional locations of these receptors are listed in **Table 11-2**.

Table 11-2: Proposed Noise Sensitive Receptors

Noise Sensitive Receptor	Nature of the receptor location	Northing	Easting
NSR 1	Residential Dwellings on the Junction of A226 and Lower Road	51° 27' 01. 63" N	0 °19' 14. 19" E
NSR 2	Residential Dwellings Adjacent to the A226	51° 27' 00. 28" N	0 °19' 10. 79" E
NSR 3	'Parklands Neighbourhood' Potential future residential dwellings within Northfleet Harbourside Development	51° 27' 08. 67" N	0°19'.03.23" E
NSR 4	Western part of the 'Harbourside Neighbourhood'. Potential future residential dwellings within Northfleet Harbourside Development	51° 27' 06. 40" N	0°19'.19.63" E
NSR 5	Eastern part of the 'Harbourside Neighbourhood'. Potential future residential dwellings within Northfleet Harbourside Development	51° 27' 06. 48" N	0°19'.38.05" E

The proposed NSRs 1 and 2 in **Table 11-2** represent existing dwellings that are closest to the Site. NSR 3 to 5 represent potential future baseline receptors if the Northfleet Harbourside development (which has resolution to grant outline planning permission) is implemented as proposed. NSR 5 is considered representative of the closest potential residential dwellings that may be cumulatively impacted by the Proposed Development and the existing Port of Tilbury turbines to the east. These receptors are not intended to be an exhaustive list of all receptors in the area, however other NSRs are anticipated to be at a greater distance and would therefore be less likely to experience potential noise generated from the Proposed Development.

Potential proxy locations may include SMC Ford Gravesend, to the east of NSR 2, and the Sian Formwork Ltd site to the south of NSR 1. If agreeable to GBC it may be possible to survey land within the southern edge of the Swanscombe Peninsula SSSI (given availability



of access) as representative of the nearest location to potential turbines associated with NSR 3.

Baseline noise surveys would be undertaken over a full range of wind speed conditions, from 5m/s to 12m/s, with correlated 10-minute sampled LIDAR data.

The duration of the survey would depend on the variability of wind speeds captured but typically, three to four weeks is an expected minimum duration to capture sufficient data; four weeks was used within the Port of Tilbury Wind Energy noise impact assessment in 2007.

It is envisaged that the baseline survey will be undertaken during the second quarter of 2025.

11.4.4 Assessment of impact

The noise chapter of the ES will include details of all assumptions and the predicted noise levels, whereby the input parameters will be stated throughout to allow for full traceability. This will be supported by a technical appendix and figures, which will include the candidate turbine noise level data and a 'checklist' of key points in line with the IOA GPG. Key stages of the noise impact assessment will be

- assessment of construction noise and vibration would be undertaken in accordance with the guidance of BS5228-1:2009+A1:2014 Parts 1 and 2 and the effect of additional traffic during the construction phase would be qualitatively assessed with reference to the DMRB;
- operational noise predictions of the proposed development would be undertaken using the proprietary noise modelling software CadnaA®, across a range of wind speeds, to determine the impacts in accordance with ETSU-R-97 and the IOA GPG;
- calculate receiver noise levels for the Proposed Development layout at nearby properties and include suggested noise monitoring locations;
- analysis of background noise data for the survey locations, plot and compare the predicted Proposed Development noise levels against the criterion curves derived from the measured background noise levels and assess the impact significance of these levels in accordance with ETSU-R-97 recommendations;
- undertake a cumulative assessment of noise contributions from the Port of Tilbury wind turbines; and
- cumulative impacts of uncorrelated (non-wind turbine) noise sources would be scoped out due to no applicable guidance on uncorrelated noise source summation.

11.4.4.1 Assessment of construction noise

Guidance for construction noise is contained within BS 5228:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites* (2014) which sets out example limits for construction noise.

The relevant noise limits for construction activities continuing for more than one month are 45, 55 and 65 dB L_{Aeq} , for three respective periods; night-time (23:00-07:00), evening and weekends (all time periods outside of night-time and daytime), and daytime (07:00-19:00) including Saturdays (07:00-13:00) respectively. Although other noise limits that apply relative to existing baseline noise levels are described, it is unlikely that they will be applied in this instance.

For vehicles accessing the Site during the construction phase, if potentially significant effects are identified in the Traffic and Transport chapter of the ES (refer to Chapter 13 of this Scoping Opinion Request), the effects will be assessed in terms of either the predicted road link noise change, or relative to the construction noise limits set out in BS 5228.



11.4.4.2 Assessment of operational noise

The overall principle of the operational noise assessment for the Proposed Development, is to determine if the total cumulative wind turbine noise would exceed the appropriate noise limit. If the noise limit is not exceeded, then it is good indication that the Proposed Development would carry a low risk. If a noise limit is exceeded, then appropriate mitigation would be required.

The basic aim of ETSU-R-97 is to provide “*indicative noise levels thought to offer reasonable protection to wind farm neighbours without placing unreasonable restrictions on wind farm developments, or adding unduly to the costs and administrative burdens on wind farm developers or local authorities*”.

ETSU-R-97 recommends that the acceptability of noise generated by wind turbines should be assessed relative to existing background noise levels at nearby properties. It recognises that both the existing background noise levels and the noise generated by wind turbines vary with wind speed and suggests that noise from wind turbines should be limited to 5dB above the background noise (L_{A90}) at all times. It does, however, also recommend that background noise levels should be limited to a lower absolute level of between 35 and 40dB L_{A90} for daytime and 43dB L_{A90} for night-time.

An increased noise limit of 45dB L_{A90} , or the background noise plus 5dB (whichever is greater), can be applied to both the daytime and night-time lower fixed limits for properties where the occupier has a degree of financial involvement in the development.

Where wind turbine noise at the nearest property is limited to 35dB L_{A90} up to wind speeds of 10m/s at 10 metres height, then it need not be considered in the noise assessment, as the amenity of these properties can be protected through the adherence to this simplified noise limit.

All of the noise limits described above apply to the total cumulative noise from all wind turbines in the area (i.e. including those at the Port of Tilbury) and are not limited solely to the Proposed Development.

11.4.5 Assessment of significance

In common with other technical topic chapters within the ES, the assessment of significance will be based on defined and explained descriptions of receptor sensitivity, magnitude of change (impact) and the resultant significance of effects. These will be described transparently within the ES chapter in a hierarchical fashion relevant to each assessment type and the guidance relevant.

11.5 Summary of the Proposed Methodology

A summary is provided in **Table 11-3** of the proposed geographical scope of assessment, scenarios to be assessed and principal technical guidance applicable to this topic within of the ES.

Table 11-3: Summary of proposed methodology – Noise

Aspect	Proposed approach
Geographical scope / study area	Assessment within the Site Assessment at defined and agreed noise sensitive receptors
Scenarios to be assessed	2025 baseline
	Construction Phase impacts
	2031 completed development



Aspect	Proposed approach
Principal technical guidance to inform the assessment within the ES	<i>Planning Practice Guidance: Noise</i> , Department for Levelling Up, Housing and Communities (DCLG) (2015)
	<i>Assessment and Rating of Noise from Wind Farms (ETSU-R-97)</i> , Working Group on Noise from Wind Turbines (1996)
	<i>Attenuation of sound during propagation outdoors. Part 2: General method of calculation ISO 9613-2:1996</i> . International Organisation for Standardisation (ISO) (1996)
	<i>A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise</i> , Institute of Acoustics (2013)
	BS5228-1:2009+A1:2014 <i>Code of practice for noise and vibration control on construction and open sites – Part 1: Noise</i> , British Standards Institution (2014)
	<i>LA111 Noise and Vibration Revision 2</i> , Design Manual for Roads and Bridges (2020).



12.0 Ornithology

12.1 Introduction

This chapter sets out the proposed approach to the evaluation of the ornithological interest of the Site, and to the assessment of potential effects on birds during construction and operation of the Proposed Development.

The potential ornithological interest on and close to the Site is influenced by the proximity adjacent to the Swanscombe Peninsula SSSI with its two diverse assemblages of breeding birds, and the presence of the Thames Estuary and Marshes SPA and Ramsar sites approximately 6 kilometres (3.75 miles) to the east with their associated wintering and passing bird interest features.

12.2 Known Baseline Conditions

A desk-based study was undertaken to collate existing bird records / data. Distribution and abundance data were collected from published sources.

An internet-based desk study was undertaken, whereby the Multi-Agency Geographic Information for the Countryside (MAGIC) website²⁶ and Natural England's designated site website²⁷ were searched for statutory designated sites, and the following search radiuses were used:

- International Statutory Sites within 10 kilometres (6.3 miles); and
- National Statutory Sites within 5 kilometres (3.1 miles).

The qualifying features of the Thames Estuary and Marshes SPA are summarised in **Table 12-1**:

Table 12-1: Summary of SPA and qualifying features

Species	5-year peak mean (1993/94 to 1997/98)	% population
Article 4.1 of Directive 79/409/EEC		
Avocet <i>Recurvirostra avosetta</i>	283 individuals - wintering	28.3% (GB)
Hen Harrier <i>Circus cyaneus</i>	7 individuals - wintering	1% (GB)
Article 4.2 of Directive 79/409/EEC		
Ringed Plover <i>Charadrius hiaticula</i>	1,324 individuals - passage	2.6% Europe/ Northern Africa (wintering)
Grey Plover <i>Pluvialis squatarola</i>	2,593 individuals - wintering	1.7% Eastern Atlantic (wintering)
Dunlin <i>Calidris alpina alpina</i>	29,646 individuals - wintering	2.1% Northern Siberia/Europe/ Western Africa
Knot <i>Calidris canutus islandica</i>	4,848 individuals - wintering	1.4% NE Can/Grl/ Iceland/NW Eur
Black-tailed Godwit <i>Limosa limosa islandica</i>	1,699 individuals - wintering	2.4% Iceland (breeding)
Redshank <i>Tringa totanus totanus</i>	3,251 individuals - wintering	2.2% Eastern Atlantic (wintering)

²⁶ [Magic Map Application \(defra.gov.uk\)](https://magic.defra.gov.uk/). Access 06.05.2024

²⁷ [Site Search \(naturalengland.org.uk\)](https://www.naturalengland.org.uk/). Access 06.05.2024



The SPA also qualifies under Article 4.2 because it is used regularly by over 20,000 waterfowl in any season (75,019 wintering waterfowl in the period 1993/94 to 1997/98).

The Ramsar designation acknowledges the importance of this wetland habitat, which includes qualification under:

- **Ramsar Criterion 5** - Species with peak counts in winter.
 - 45,118 waterfowl (5-year peak mean 1998/99-2002/2003).
- **Ramsar Criterion 6** - Species/populations occurring at levels of international importance.
 - Species with peak counts in spring/autumn: Black-tailed godwit *Limosa limosa islandica*, Iceland/Western Europe 1,640 individuals, representing an average of 4.5% of the population (5-year peak mean 1998/9-2002/3).
 - Species with peak counts in winter: Dunlin *Calidris alpina alpina*, Western Siberia/Western Europe 15,171 individuals, representing an average of 1.1% of the population (5-year peak mean 1998/9-2002/3); Red knot, *Calidris canutus islandica*, Western & Southern Africa (wintering) 7,279 individuals, representing an average of 1.6% of the population (5-year peak mean 1998/9-2002/3).

The Shorne Marshes RSPB reserve lies within the extent of the SPA and Ramsar sites.

Additional desk-based information sources consulted included:

- Kent and Medway Biological Records Centre (KMBRC);
- UK Biodiversity Action Plan (BAP);
- The Birds of Conservation Concern (BoCC) (Stanbury et al., 2021);²⁸ and
- International Union for the Conservation of Nature (IUCN, 2023)²⁹ Red list of threatened species.

Relevant guidance³⁰ was used for initial survey design. A range of baseline ornithological surveys commenced within the Study Area and surroundings in April 2023 and continued until end of March 2024 (providing 12 months of data). The following surveys have been undertaken within the Study Area shown on **Figure 1.1**:

- breeding bird surveys - six survey visits between April to July 2023 within the Study Area;
- flight activity (vantage point) surveys (April 2023 to March 2024) - within the Study Area, amounting to 72 hours of survey effort; and
- non-breeding bird surveys – two surveys per month between October 2023 and March 2024 within the Study Area.

Survey methods follow contemporary good practice guidance; further details of the survey methods and summary findings of these surveys are provided below. Ornithological surveys have continued within relevant seasonal periods through 2024 and into 2025 so as to provide two complete seasons of baseline data.

²⁸ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., & Win I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

²⁹ IUCN. (2023). IUCN Red List of Threatened Species (ver. 2022-2). Available at: <http://www.iucnredlist.org>. (Accessed: May 2023).

³⁰ Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH, 2017)



12.2.1 Breeding Bird Survey

Surveys for breeding birds were carried out within the survey area following adapted Common Bird Census (CBC) methodology described by Gilbert *et al* (1998)³¹. The survey was undertaken across the Study Area shown on **Figure 1.1**.

The surveyor traversed the Site so that each part had been approached within 50 metres, stopping at regular intervals of 100 metres to scan the area with binoculars and listen for calls and/or songs. In keeping with relevant guidelines³², the Study Area was visited six times. The direction of the transect was varied over the surveys to ensure different areas were accessed at different times of the morning.

All bird species seen or heard were recorded on a map using BTO standard species codes³³. Behavioural notations were also recorded; flying, calling, alarm calling, singing, birds with material for nests, or carrying food to provision young, fledged young, any nests observed, and other breeding behaviours were recorded.

Summarised results of the breeding bird survey are provided in **Table 12-2**, with all listed species being identified on or adjacent to greenfield parts of the Study Area within the Swanscombe Peninsula SSSI. The maximum count figures are the peak flock count recorded in the survey visits. A total of 23 species were recorded during the six breeding bird survey visits, with some species probably breeding, some possibly breeding, and two were unlikely to be breeding within the Study Area. No confirmed breeding was recorded.

Table 12-2: Summary of the breeding bird survey

Species	Number of survey visits recorded (max count)	Territories recorded in the Study Area	Species associated with the SSSI	Annex 1 species	Schedule 1 species	Section 41 species	Red List species of conservation concern	Amber List species of conservation concern	Green List species of conservation concern
Cetti's Warbler <i>Cettia cetti</i>	6/6 (8)	Yes (5)	Yes		Yes				
Sedge Warbler <i>Acrocephalus schoenobaenus</i>	1/6 (1)	No	Yes						
Reed Warbler <i>Acrocephalus scirpaceus</i>	6/6 (6)	Probable	Yes						
Kingfisher <i>Alcedo atthis</i>	1/6 (1)	No		Yes	Yes			Yes	
Cuckoo <i>Cuculus canorus</i>	2/6(1)	No				Yes	Yes		
Skylark <i>Alauda arvensis</i>	3/6 (1)	No				Yes	Yes		

³¹ Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Sandy

³² Bird Survey Guidelines (n.d.). *Bird Survey Guidelines | for ecological impact assessment*. [online] Available at: <https://birdsurveyguidelines.org/> [Accessed 28 Feb. 2024].

³³ https://www.bto.org/sites/default/files/u16/downloads/forms_instructions/bto_bird_species_codes.pdf



Species	Number of survey visits recorded (max count)	Territories recorded in the Study Area	Species associated with the SSSI	Annex 1 species	Schedule 1 species	Section 41 species	Red List species of conservation concern	Amber List species of conservation concern	Green List species of conservation concern
Song thrush <i>Turdus philomelos</i>	1/6 (3)	No				Yes			
Dunnock <i>Prunella modularis</i>	3/6 (2)	Yes (1)				Yes			
Greenfinch <i>Chloris chloris</i>	3/6 (3)	Yes (1)					Yes		
Moorhen <i>Gallinula chloropus</i>	2/6 (2)	Possible						Yes	
Kestrel <i>Falco tinnunculus</i>	1/6 (1)	No						Yes	
Whitethroat <i>Sylvia communis</i>	5/6 (5)	Yes (2)						Yes	
Wren <i>Troglodytes troglodytes</i>	6/6 (5)	Probable						Yes	
Blue tit <i>Cyanistes caeruleus</i>	5/6 (7)	Probable							Yes
Great tit <i>Parus major</i>	2/6 (2)	Probable							Yes
Chiffchaff <i>Phylloscopus collybita</i>	6/6 (4)	Probable							Yes
Blackcap <i>Sylvia atricapilla</i>	6/6 (4)	Probable							Yes
Blackbird <i>Turdus merula</i>	6/6 (6)	Probable							Yes
Robin <i>Erithacus rubecula</i>	6/6 (4)	Probable							Yes
Goldfinch <i>Carduelis carduelis</i>	6/6 (27)	Probable							Yes
Feral pigeon <i>Columba livia domestica</i>	1/6 (7)	Possible							Yes



Species	Number of survey visits recorded (max count)	Territories recorded in the Study Area	Species associated with the SSSI	Annex 1 species	Schedule 1 species	Section 41 species	Red List species of conservation concern	Amber List species of conservation concern	Green List species of conservation concern
Collared dove <i>Streptopelia decaocto</i>	1/6 (2)	Possible							Yes
Chaffinch <i>Fringilla coelebs</i>	2/6 (2)	Possible							Yes

12.2.2 Flight Activity Survey

This section presents the findings of vantage point (VP) surveys, undertaken between April 2023 – March 2024. VP watches aimed to quantify the flight activity of primary and secondary target species within the study area. The main purpose of VP watches is to collect data on primary target species that will enable estimates to be made of:

- the time spent flying over the Study Area;
- the relative use by birds of different parts of the Study Area; and
- the proportion of flying time spent within the provisional upper and lower risk height limits as determined by the potential rotor diameter and rotor hub height.

For each primary target species observation, the following details were recorded:

- time of observation;
- duration of flying bout;
- species, age and sex (where determinable); and
- time spent within each height band.

Height bands were determined allowing for the most likely rotor tip height of 125 metres above foundations and a lowest likely rotor swept height of 35 metres. Flight heights were attributed to three distinct height bands as follows:

- 1 = < 35 m (below the likely rotor swept area);
- 2 = 35 m to 125 m (within the likely rotor swept area, at least in part);
- 3 = > 125 m (above the most likely rotor swept area).

In addition, a summary of observations of secondary target species was recorded at the end of each five-minute period during VP watches to provide an index of flight activity for secondary target species within the site, in accordance with current NatureScot guidance, which represents applicable guidance for onshore wind energy development in England.

The survey establishes baseline conditions of bird assemblages and determine importance of the Study Area to primary and secondary target bird species. Target species for the flight activity surveys were defined by the legal and conservation status, the vulnerability of species



to wind turbines, and the local importance of species as outlined in Natural England (NE)³⁴ and NatureScot (NS) guidance (2017)³⁵.

- Primary target species are classified as: Annex I and/or Schedule 1 raptor and owl species (including kestrel due to behaviour that makes this species vulnerable to impact from wind turbines), all wildfowl species, excluding feral geese and all wader species.
- Secondary species: Local circumstances may indicate that survey information should also be acquired on other species, especially those of regional conservation concern or where the likelihood of strike is high. Such species are termed secondary species. Recording of secondary species is subsidiary to recording of primary target species. Non-Annex 1 and/or Schedule 1 raptor and owl, wildfowl, wader and hirundine species.

VP surveys were undertaken following NS guidance over both the breeding and non-breeding seasons. Due to the small size of the Study Area, it was deemed that only one VP was required to fully observe and assess the Site (**Figure 12.1**).

Consistent with NS guidance, a total of 72 hours of survey were undertaken from April 2023 to March 2024. Survey effort was split with 36 hours of effort undertaken in each season (breeding (March to September) and non-breeding (October to February)), averaging two 3-hour observations each month. Surveys were focused over the high tide period when wading birds were more likely to traverse or utilise (roost on) the Site, tide time was read from Tilbury tide charts.

12.2.2.1 Primary Target Species

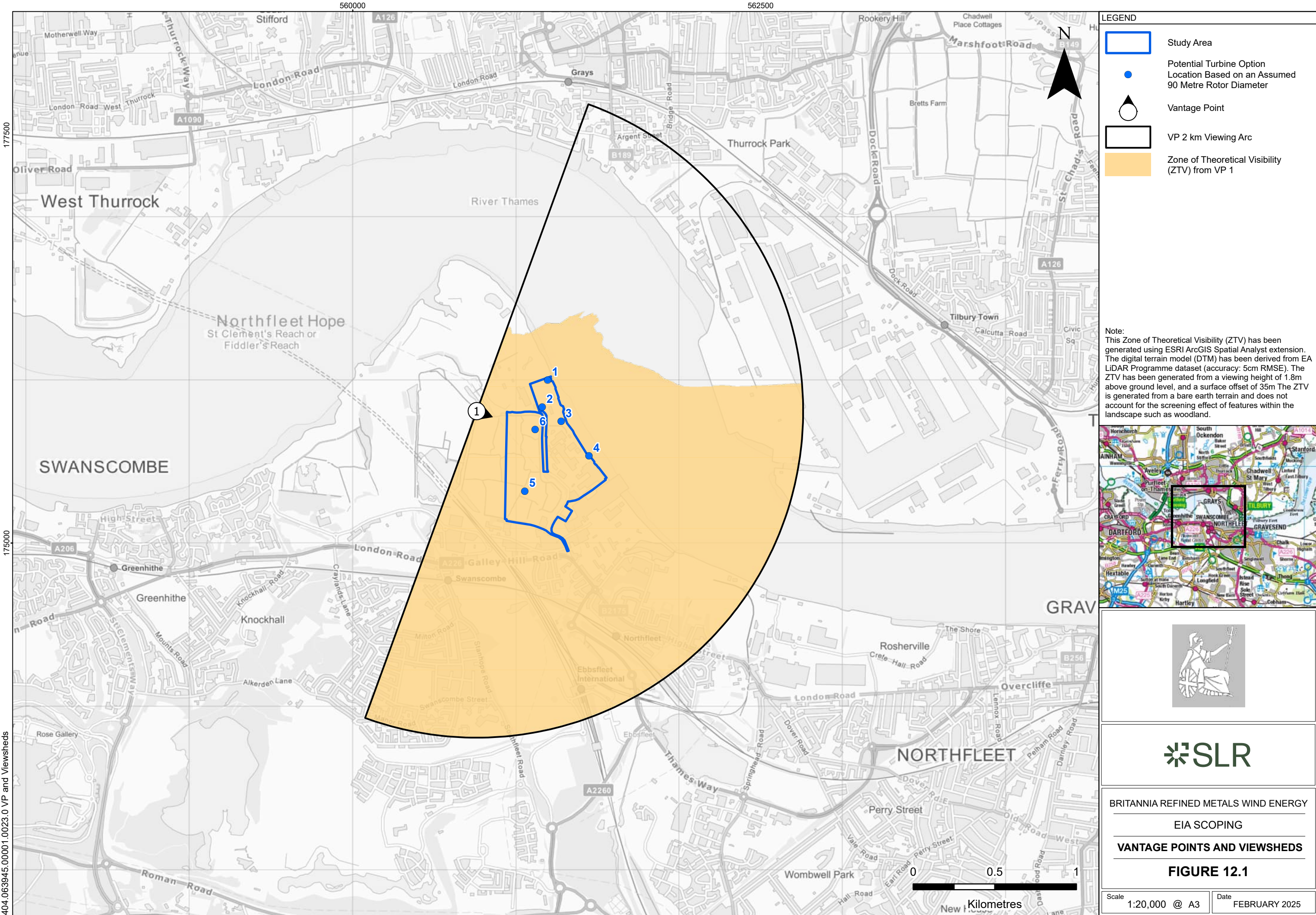
Species that met the requirements for primary species were;

- Gadwall *Anas strepera*
- Goshawk *Accipiter gentilis*
- Green sandpiper *Tringa ochropus*
- Greylag *Anser anser*
- Hobby *Falco subbuteo*
- Kestrel
- Lapwing *Vanellus vanellus*
- Little Egret *Egretta garzetta*
- Marsh harrier *Circus aeruginosus*
- Mute Swan *Cygnus olor*
- Oystercatcher *Haematopus ostralegus*
- Peregrine *Falco peregrinus*
- Shelduck *Tadorna tadorna*
- Shoveler *Spatula clypeata*
- Snipe *Gallinago gallinago*

³⁴ J.A.Bright, R.H.W.Langston, and S.Anthony. (2009). Mapped and written guidance in relation to birds and onshore wind energy development in England.

³⁵ Scottish Natural Heritage (2017). *Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms V2*. Scottish Natural Heritage, Inverness.





- LEGEND
- Study Area
 - Potential Turbine Option
Location Based on an Assumed
90 Metre Rotor Diameter
 - Vantage Point
 - VP 2 km Viewing Arc
 - Zone of Theoretical Visibility
(ZTV) from VP 1

Note:
This Zone of Theoretical Visibility (ZTV) has been generated using ESRI ArcGIS Spatial Analyst extension. The digital terrain model (DTM) has been derived from EA LiDAR Programme dataset (accuracy: 5cm RMSE). The ZTV has been generated from a viewing height of 1.8m above ground level, and a surface offset of 35m. The ZTV is generated from a bare earth terrain and does not account for the screening effect of features within the landscape such as woodland.



SLR

BRITANNIA REFINED METALS WIND ENERGY

EIA SCOPING

VANTAGE POINTS AND VIEWSHEDS

FIGURE 12.1

Scale 1:20,000 @ A3

Date FEBRUARY 2025

- Teal *Anas crecca*
- Whooper swan *Cygnus cygnus*.

The results of the vantage point surveys for primary species are summarised within **Table 12-3**. Collision height for the most likely wind turbine parameters has been considered as 35 metres above ground level to 125 metres above ground level.

Table 12-3: Summary of the Vantage Point survey – Primary Species

Species	Number of flight paths recorded across the Study Area	Total number of birds recorded	Maximum number of individuals recorded	At collision risk height?
Gadwall	1	4	4	Yes
Goshawk	2	1	1	Yes
Green sandpiper	1	1	1	No
Greylag goose	27	262	17	Some
Hobby	2	2	1	One
Kestrel	45	N/A	2	Some
Lapwing	3	123	120	All
Little egret	2	3	2	No
Marsh harrier	21	N/A	2	Some
Mute swan	1	2	2	No
Oystercatcher	0	0	0	N/A
Peregrine	4	4	1	One
Shelduck	6	19	7	Some
Shoveler	1	1	1	No
Snipe	3	15	8	No
Teal	1	1	1	No
Whooper swan	1	1	1	Yes

The majority of flights recorded were over the western side of the Study Area, associated with the Botany Marshes and Swanscombe Peninsula SSSI, although there were flights across the whole Initial Study Area during the period of Vantage Point surveys. The results of the Vantage Point surveys informed the process of determining preferred turbine locations, as described within Chapter 3 of this Scoping Opinion Request.

Analysis of flights in the vicinity of the proposed turbine locations is provided in **Table 12-4**, showing the number of flights for each species within the area of each proposed turbine, the maximum number of birds recorded on a flight and the number of flights that were recorded within the potential collision risk (CR) height.



Table 12-4: Vantage Point Primary Species – Turbine locations

Species	Turbine A			Turbine B			Turbine C		
	Flights	Birds	CR height	Flights	Birds	CR height	Flights	Birds	CR height
Gadwall	1	4	1	/	/	/	/	/	/
Goshawk	1	1	1	1	1	1	1	1	1
Green sandpiper	/	/	/	/	/	/	/	/	/
Greylag goose	/	/	/	1	3	0	/	/	/
Hobby	2	1	1	/	/	/	/	/	/
Kestrel	3	1	1	3	1	0	2	1	0
Lapwing	/	/	/	/	/	/	/	/	/
Little egret	/	/	/	/	/	/	/	/	/
Marsh harrier	1	1	0	1	1	1	/	/	/
Mute swan	/	/	/	/	/	/	/	/	/
Oystercatcher	/	/	/	/	/	/	/	/	/
Peregrine	1	1	1	/	/	/	/	/	/
Shelduck	/	/	/	/	/	/	/	/	/
Shoveler	/	/	/	/	/	/	/	/	/
Snipe	/	/	/	/	/	/	/	/	/
Teal	/	/	/	/	/	/	/	/	/
Whooper swan	/	/	/	/	/	/	/	/	/

12.2.2.2 Secondary Target Species

Secondary species recorded during the surveys included:

- Black headed gull *Chroicocephalus ridibundus*
- Canada goose *Branta canadensis*
- Common buzzard *Buteo buteo*
- Common gull *Larus canus*
- Cormorant *Phalococorax carbo*
- Fieldfare *Turdus pilaris*
- Goosander *Mergus merganser*
- Great black-backed gull *Larus marinus*
- Grey heron *Ardea cinerea*
- Herring gull *Larus argentatus*
- Mallard *Anas platyrhchos*
- Mediterranean gull *Larus melanocephalus*
- Raven *Corvus corax*



- Sparrowhawk *Accipiter niscus*
- Water rail *Rallus aquaticus*.

Table 12-5: Number of Secondary Target Species recorded

Species	Number of 5-minute interval periods recorded by month											
	2023									2024		
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Herring gull				37	36	44	37	43	40	33	31	20
Common buzzard		2			1	5	1		1	1	4	3
Canada goose									1	3	1	3
Black-headed gull	11	10	22	19	5	9	19	30	24	16	30	34
Great black-backed gull				1	1			1	1		1	
Cormorant				4		1		1			2	
Common gull								4	1	2	1	3
Mallard	3	3		1		1	1	4	3	3	2	4
Goosander								1		2		
Grey heron		1		1		1					1	1
Mediterranean gull				1	14	16	7	10	11	15	15	7
Sparrowhawk				3	5		1		1	2	2	1

12.2.3 Non-breeding (Wintering) Birds Survey

Non-breeding bird surveys were carried out twice a month between October 2023 and March 2024. Surveys followed the methodology described by the Bird Survey & Assessment Steering Group³⁶, which involved the surveyor walking a transect at a slow, ambling pace, stopping to scan priority habitat/features, and ensuring all accessible areas of the Study Area were covered. A 400-metre buffer zone was applied to the Study Area shown on **Figure 1.1** to this Scoping Opinion Request.

The direction of the transect route was alternated between visits to ensure different areas of the Study Area were accessed at different times of the day. The surveyor carried a pair of binoculars and a telescope to aid recording where necessary. All visual and auditory contact with birds of all species was recorded, mapping the locations on a field map using BTO one and two letter species codes. Behavioural notation was also used to record the bird's behaviour for each encounter.

Priority species were defined as those listed on the Wildlife & Countryside Act 1981 (as amended) – Sch. 1, Birds Directive Annex I, NERC Act S41, and BoCC red and amber lists.

Throughout all 12 non-breeding bird surveys, 37 priority species were recorded within the Study Area, all of which are listed in **Table 12-6**, which also provides a summary of when the species were recorded and their peak flock count (i.e., the total number of individual birds recorded at any one time during a single survey). Record summaries reflect the total number

³⁶ Bird Survey & Assessment Steering Group. 2023. Bird Survey Guidelines for assessing ecological impacts, v.1.1.0. <https://birdsurguidelines.org/> [accessed 07/08/2023]



of birds recorded across the entire Study Area and related survey buffer zone on that particular visit.

Table 12-6: Wintering (non-breeding) priority species survey results

Species	BoCC Status	Number of visits species was observed on	Location in relation to the Study Area
Linnet	Red	5/12	Scrub habitats within and outside the Study Area
Herring gull	Red	5/12	Two occasions within the Study Area, remainder within the 400-metre buffer
Skylark	Red	1/12	Western boundary of the Study Area
Mistle thrush	Red	1/12	Within the Study Area, and the 400-metre buffer
Starling	Red	2/12	Within the Study Area, and the 400-metre buffer
Fieldfare	Red	4/12	Within the Study Area, and the 400-metre buffer
Greenfinch	Red	4/12	Scrub habitats within the Study Area
Greylag goose	Amber	9/12	Western side within 400-metre buffer
Shelduck	Amber	3/12	Western side within Initial Study Area
Shoveler	Amber	1/12	Western side
Marsh harrier	Amber	6/12	Beyond western side of the Study Area
Reed bunting	Amber	1/12	Western side of the Study Area
Mallard	Amber	8/12	Mainly within the buffer west of the Study Area
Teal	Amber	2/12	Within the buffer west of the Study Area
Stock dove	Amber	9/12	Three occasions within the Study Area, remainder within the 400-metre buffer
Woodpigeon	Amber	12/12	Within the Study Area, and the 400-metre buffer
Moorhen	Amber	3/12	Within the Study Area, and the 400-metre buffer
Snipe	Amber	2/12	Within the buffer west of the Study Area
Black-headed gull	Amber	9/12	Two occasions within the Study Area, remainder within the 400-metre buffer
Common gull	Amber	3/12	Within the buffer west of the Study Area
Lesser Black-backed gull	Amber	2/12	Within the buffer west of the Study Area
Sparrowhawk	Amber	3/12	Within the Study Area
Kingfisher	Amber	2/12	Within the Study Area
Kestrel	Amber	7/12	Within the Study Area, and the 400-metre buffer
Wren	Amber	10/12	Within the Study Area, and the 400-metre buffer
Song thrush	Amber	4/12	Scrub habitats within the Study Area
Redwing	Amber	2/12	Scrub habitats within the Study Area
Dunnock	Amber	11/12	Within the Study Area
Grey wagtail	Amber	3/12	Within the Study Area
Meadow pipit	Amber	1/12	Within the buffer west of the Study Area



Species	BoCC Status	Number of visits species was observed on	Location in relation to the Study Area
Peregrine	Green	1/12	Along the western boundary of the Study Area
Cetti's warbler	Green	10/12	Scrub habitats on Botany Marshes East
Grey heron	Green	1/12	Southwestern edge of the Study Area
Egyptian goose	Green	2/12	Within the buffer west of the Study Area
Canada goose	Green	6/12	Within the buffer west of the Study Area
Collared dove	Green	6/12	Within the Study Area
Firecrest	Green	1/12	Along the northwestern boundary of the Study Area

The non-breeding bird assemblage within the Study Area is diverse, with 59 species in total including priority and non-priority species.

None of the overwintering or passaging bird species listed as qualifying interest features for the Thames Estuary and Marshes SPA were recorded (either within the Study Area or flyover) during the wintering birds survey. One qualifying interest feature species listed for the Thames Estuary and Marshes Ramsar Site citation (Water rail) was recorded on one occasion.

Almost all waterbird species including gulls and those referenced in the Swanscombe Peninsula SSSI citation were recorded outside of the Study Area on the western side of Botany Marshes, which was within the 400-metre buffer.

Marsh harrier was observed to be foraging across the 400-metre buffer zone area to the west of the Study Area but not over the Study Area itself, likely due to less suitable habitat within the Study Area.

A total of 70 registrations of Cetti's warbler were made across all survey visits with larger numbers recorded during October which is likely to relate to the detectability of the species with more singing birds typically recorded during spring and late autumn as opposed to their apparent lack of presence during other survey visits. The species is rarely seen due to its skulking nature deep within its favoured dense scrubby habitats.

Linnet and reed bunting were also recorded in low numbers across the Site and within the 400-metre survey buffer zone and again were also present within suitable breeding habitats.

Other priority species as listed above within **Table 12-5** were also present across the Study Area and included species listed on the Wildlife and Countryside Act (1981) Schedule 1 list and comprise:

- Marsh harrier
- Cetti's warbler
- Kingfisher
- Peregrine
- Firecrest
- Redwing
- Fieldfare.

Of these species, both Marsh harrier and Cetti's warbler are mentioned above in regard to the Swanscombe Peninsula SSSI citation, however, kingfisher, peregrine and firecrest were



recorded within the Study Area at very low frequency. Conversely, redwing and fieldfare are migratory winter visitors to the UK and appeared to be using the Study Area and surrounding areas for foraging. Both species tend to flock together and strip sites of available food sources, namely berries and small fruits, and move on when this food source is depleted.

12.3 Key Issues and Requirement for Assessment

The intent of this section of the Scoping Opinion Request is to determine whether individual elements should be included within the ES scope, rather than provide a detailed appraisal of likely impact (this will be provided within the ES).

Particular consideration will be given in the assessment to potential effects on bird species whose populations are of moderate to high Nature Conservation Importance and that belong to taxonomic groups that are considered to be particularly susceptible to impacts from the Proposed Development. These include:

- species listed on Annex 1 of European Council Directive 2009/147/EC on the conservation of wild birds (i.e., 'Annex 1' species), in particular those that may be associated with populations of species that are qualifying interests of SPAs in the wider area;
- species listed in Schedule 1 to the Wildlife and Countryside Act 1981, as amended (i.e., 'Schedule 1' species); and
- species of national conservation concern, not included within the above categories, but that are present within the study area in nationally or regionally important numbers (e.g. species on the UK Red List of Birds of Conservation Concern (Stanbury et al., 2021)).

Taking account of the findings of the work undertaken to date, whilst still adopting a precautionary approach, potential ornithological effects associated with construction and/or operation of the Proposed Development include:

- **disturbance and/or displacement from supporting habitats during construction or decommissioning works.**
- **loss / degradation of habitats through construction works, permanent structures and access tracks** – the layout for the Proposed Development described within Chapter 3 of this Scoping Opinion Request will avoid loss of degradation of suitable habitat for bird species and the location of the proposed turbines on existing operational areas of the Site will avoid the need for construction of dedicated access tracks;
- **inadvertent damage to nests during construction and decommissioning** – similarly, the layout for the Proposed Development described within Chapter 3 of this Scoping Opinion Request is envisaged to avoid inadvertent damage to nests; particularly ground nesting birds;
- **displacement from and disturbance to foraging, nesting, roosting habitat from the operational Development.**
- **mortality or injury from collision with wind turbine blades;** and
- **the potential for cumulative effects** arising from the combined effects of other existing and Proposed Developments within the wider area affecting the same bird populations.



Table 12-7: Summary of potential significant effects – Ornithology

Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Disturbance and / or displacement from supporting habitats during construction	Low to High	Small to Medium	Yes – included
Loss / degradation of habitats through construction works, permanent structures and access tracks	Low to High	Negligible	No – Not included
Inadvertent damage to nests during construction and decommissioning	Low to High	Negligible	No – Not included
Displacement from and disturbance to foraging, nesting, roosting habitat from the operational Development.	Low to High	Small to Medium	Yes – included
Mortality or injury from collision with wind turbine blades	Low to High	Small to Medium	Yes – included
The potential for cumulative effects arising from the combined effects of other existing and Proposed Developments within the wider area affecting the same bird populations	Low to High	Small to Medium	Yes – included

Species of low conservation concern (e.g., green-listed Birds of Conservation Concern), or those not considered sensitive to wind energy developments are proposed to be scoped out of the assessment, as per NatureScot guidance (SNH, 2018), which is applicable guidance for onshore wind energy developments in England.

12.4 Assessment Methodology

12.4.1 Proposed study area extent

The proposed geographical extent of assessment on ornithological effects will include the Site shown on **Figure 1.1** to this Scoping Opinion Request; the Study Area also shown on **Figure 1.1** plus a 400 metre buffer; and the qualifying ornithological interest features of International Statutory Designated Sites within 10 kilometres (6.3 miles) of the Site.

12.4.2 Legislation, standards and guidance

The principal guidance informing the assessment of ornithological effects within the ES will be:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine*, Chartered Institute of Ecological Management and Assessment (2018 – Updated 2022).
- *Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms V2*. Scottish Natural Heritage (2017).
- *Calculating a theoretical collision risk assuming no avoiding action* (SNH 2000);



- *Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model* (SNH 2018).
- *A Review of Disturbance Distances in Selected Bird Species* (SNH 2007).
- *Significance of impacts on birds within or affecting designated areas* (SNH 2013).
- *Guidance on Assessing Connectivity with Special Protection Areas* (SNH, June 2016).
- *Assessing the Significance of Impacts from Onshore Wind Farms Outwith Designated Areas* (SNH, February 2018).
- *Making Space for Renewable Energy: assessing onshore wind energy development*. NE254 Wind Energy Report, Natural England (2010).
- *Bird Survey Guidelines for assessing ecological impacts, v.1.1.0*, Bird Survey & Assessment Steering Group. 2023.

12.4.3 Approach to the assessment

12.4.3.1 General approach to ornithological assessment within the ES

Assessment of ornithology will be presented within its own chapter within the ES. Effects will be assessed against the existing baseline conditions, i.e., without the Proposed Development present. This assessment will be carried out assuming that there are no existing significant adverse effects on the population, range or distribution of a species (i.e., no significant effect on the species' conservation status) and no significant interference with the flight paths of migratory birds.

The assessment will therefore first identify the possible effects of the Proposed Development and will then consider the likelihood of their occurrence. A judgement will then be made as to whether or not these effects are significant with respect to the EIA Regulations. In judging whether a possible effect is significant or not, two principal factors will be taken into account; the nature conservation importance of the bird populations present and the magnitude of the likely effect. In assessing the effects, emphasis will be given populations of national and regional importance.

Impacts will be assessed in relation to species' population, range and distribution. Key considerations will include territory occupancy, breeding success, foraging success and ranging behaviour. The assessment will:

- identify the ornithological receptors that could be significantly affected by the Proposed Development;
- assess the relative importance of these receptors at the relevant geographical scale (also referred to in EIA terms as receptor 'sensitivity') of the receptor informed by data from baseline surveys and other appropriate published information sources;
- identify and systematically characterise impacts and their effects (within the limits of scientific evidence), noting any uncertainties and taking a precautionary approach as appropriate;
- review potential for measures to avoid and mitigate negative impacts and effects; and
- assessing the significance of any residual effects after the beneficial effects of any proposed mitigation has been taken into account.

The significance of each potential effect will be judged by integrating stated scales relating to ecological value, behavioural sensitivity and effects magnitude in a reasoned way, in the context of the status of, and trends within, species' regional populations (as defined by JNCC, RSPB and BTO). If required, measures will be presented to mitigate any effects deemed to be significant in terms of the EIA Regulations.



12.4.3.2 Assessment of collision risk

Annual collision rates for key species will be estimated following a method developed by Band et al. (2007³⁷). The process involves three stages

1. estimation of the number of transits through the proposed rotor swept volume per year, based on observed flight activity data and parameters of the Proposed Development and wind turbine specification;
2. estimation of the predicted proportion of transits through the rotor swept volume that would result in a collision between the bird and a wind turbine blade. All predicted collisions are assumed to be fatal. This provides an estimate of the number of fatalities per year for the Proposed Development assuming that no bird takes avoiding action to prevent a collision; and
3. an assumed rate for collision avoidance is applied to the estimate. Birds may display avoidance at several spatial scales: e.g. avoiding a wind energy development as a whole; altering flight direction to avoid turbines (e.g. flying between turbines); or taking action very close to an individual turbine to avoid a collision. A typical recommended default avoidance rate is 95% (SNH) but literature reviews of bird collision monitoring studies have suggested increasing these rates for some species. Estimates of collision risk / mortality will be calculated within the ES for the receptors species where there was sufficient data to carry out the analyses.

This method is more suitable for some species than others (Madders and Whitfield 2006). For example, small and fast-moving birds such as hobby can be difficult to detect beyond a distance of a few hundred metres and this can result in under-estimates of flight activity based on observational data alone. For these species collision risk is best assessed through other means, for example territory modelling and assumptions about flight activity, rather than collision risk modelling alone.

12.4.4 Approach to mitigation

Potentially significant adverse effects on sensitive ornithological receptors will be considered by following the mitigation hierarchy principles:

- **avoidance:** Seek options / alternative location(s) or layouts that avoid / reduce risk of harm (e.g. locating wind turbines away from regularly used flight areas);
- **mitigation:** Potentially significant adverse effects avoided or minimised through mitigation measures (e.g. timing of works to avoid / reduce disturbance to breeding birds); and
- **compensation:** Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures (e.g. habitat improvement or creation outside the zone of effect of the Proposed Development).

In addition, the Proposed Development would seek to identify opportunities for ecological enhancement to complement statutory requirements for Biodiversity Net Gain.

12.5 Summary of the Proposed Methodology

A summary is provided in **Table 12-8** of the proposed geographical scope of assessment, scenarios to be assessed and principal technical guidance applicable to this topic within of the ES.

³⁷ Band, W., Madders, M. and Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at Wind Farms. In de Lucas, M., Janss, G. and Ferrer, M. (eds.) Birds and Wind Power. Quercus



Table 12-8: Summary of proposed methodology – Ornithology

Aspect	Proposed approach
Geographical scope / study area	Assessment of impacts to ornithology within the Site
	Assessment of impacts to ornithology within the Study Area and a 400-metre buffer of it
	Assessment of impacts to the qualifying interest features of International Statutory Designated Sites within a 10-kilometre radius of the Site
Scenarios to be assessed	2023, 2024 and 2025 baseline
	Construction phase impacts
	2031 completed development
Principal technical guidance to inform the assessment within the ES	<i>Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine</i> , Chartered Institute of Ecological Management and Assessment (2018 – Updated 2022)
	<i>Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms V2</i> . Scottish Natural Heritage (2017)
	<i>Calculating a theoretical collision risk assuming no avoiding action</i> (SNH 2000);
	<i>Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model</i> (SNH 2018)
	<i>A Review of Disturbance Distances in Selected Bird Species</i> (SNH 2007)
	<i>Significance of impacts on birds within or affecting designated areas</i> (SNH 2013)
	<i>Guidance on Assessing Connectivity with Special Protection Areas</i> (SNH, June 2016)
	<i>Assessing the Significance of Impacts from Onshore Wind Farms Outwith Designated Areas</i> (SNH, February 2018)
	<i>Making Space for Renewable Energy: assessing onshore wind energy development. NE254 Wind Energy Report</i> , Natural England (2010)
	<i>Bird Survey Guidelines for assessing ecological impacts, v.1.1.0</i> , Bird Survey & Assessment Steering Group. 2023.



13.0 Traffic and Transportation

13.1 Introduction

This chapter of the Scoping Opinion Request outlines the proposed scope of work required to assess the potential significant effects associated with access, traffic and transport during the construction, operational and decommissioning phases of the Proposed Development.

It is envisaged that the principal means of transporting wind turbine components to the Site will be via road from the Port of Tilbury and this has been used as the basis for consideration of assessment scope in the ES. It is however possible that some or all components could be delivered via the Seacon Terminal to the south of the Site, or other port/terminal facilities, if feasible/viable at the time of construction, which would reduce journey distances on road.

13.2 Known Baseline Conditions

The Site is well served by existing roads and rail routes, with principal access routes including the A2 to the south and the A226. Local railway stations include Swanscombe, Northfleet and Ebbsfleet International.

The Site is accessed from Manor Way and Lower Road, which connect to the A226 at the southern end of Lower Road. Manor Way is an industrial estate road of approximately 6 metres in width. There is no footway or street lighting along Manor Way, and it is envisaged that this link would not be frequently used by pedestrians or cyclists.

Lower Road connects to Manor Way close to the main vehicular entrance into the Site. Its northern length is of comparable width and character to Manor Way but there is a substantial HGV layby alongside its northern end and pavements / street lighting at its southern end. Carriageway width at the southern end of Lower Road increases to approximately 9 metres but the effective width of this link is reduced by on-street parking associated with the adjacent commercial / industrial units; some of this parking also overlaps footways.

The connection between Lower Road and the A226 is a three-arm signalised junction with central reservation along the A226 arms east and west of the junction. Travelling west, the A226 has a single lane in either direction and footways along both sides of the road for much of its length. Approximate carriageway width is 6.5 metres, and the character of the road varies; this includes some sections with no frontage development, some with residential frontage development and some having a mix of residential/retail/commercial frontage development.

The A226 connects to the B255 via a four-arm roundabout. The B255 runs approximately north-south and connects to the A2 at its southern end via the Bean Interchange. At its northern end, the B255 is a dual carriageway road of approximately 24 metres in total width (two lanes in either direction and central reservation), with a bus lane and shared surface route for pedestrians and cyclists. South of the Bluewater Parkway / Eastern Avenue roundabout junction, the bus lane stops but the shared surface continues towards the Bean Interchange.

The A2 is a major Trunk Road with three lanes in either direction. It flows approximately east-west and connects with the M25 motorway at Junction 2.

Primary traffic counts have not yet been undertaken but publicly available baseline information on the key links along the envisaged turbine delivery route has been obtained from the Department for Transport Road Traffic Statistics³⁸. These are presented within **Table 13-1**.

³⁸ <https://roadtraffic.dft.gov.uk/manualcountpoints>



Table 13-1: Recorded and estimated road traffic flows (Annual Average Daily Flows)

Year	DfT Link Reference	Type	Total vehicles	Total HGV	HGV %
A226					
2023	80930	Estimated from previous year	12,661	529	4.18%
2022		Manual Count	12,459	540	4.33%
A2					
2023	89044	Manual Count	142,232	10,795	8.29%
2022		Manual Count	137,441	10,472	8.32%
A282 (Dartford Crossing Approach)					
2023	86048	Manual Count	126,047	17,915	14.21%
2022		Manual Count	128,526	19,466	15.15%
A13					
2023	27931	Estimated from the previous year	81,755	10,385	12.70%
2022		Manual Count	80,631	10,560	13.09%
A1089					
2023	7895	Estimated from the previous year	32,250	6,652	20.63%
2022		Manual Count	32,047	6,789	21.18%

The DfT data indicates that all five roads carry substantial amounts of vehicles and the A2 / A282 / A13 and A1089 have a high proportion of HGVs. It is therefore considered that these roads along the proposed route would be of a suitable character for the transport of wind turbine components from the Port of Tilbury to the Site and would also be suitable for the general construction traffic associated with the construction of the wind turbines.

Initial review of highway geometry along the potential transport route for wind turbine components has indicated that there would be no significant constraints to the movement of abnormal indivisible loads (AILs) associated with the biggest of the two potential wind turbine options. The right-hand bend on Lower Road, approaching the Site will require Swept Path Analysis and this will also be undertaken at other locations along the proposed route.

13.3 Key Issues and Requirement for Assessment

The intent of this section of the Scoping Opinion Request is to determine whether individual elements should be included within the ES scope, rather than provide a detailed appraisal of likely impact (this will be provided within the ES).

13.3.1 Construction Traffic – Abnormal Indivisible Loads

In terms of potential effect of road traffic movements during construction of the Proposed Development, up to ten envisaged AIL traffic trips (20 movements) required for each turbine would represent a very small proportion of the total Annual Average Daily Flow and HGV component of the principal transport links along the potential route from the Port of Tilbury (as shown in **Table 13-1**). The IEMA guidelines on the *Environmental Assessment of Traffic*



and Movement (July 2023) provide two thresholds when considering predicted increase in traffic, whereby a full assessment is required:

- include road links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%); and
- include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

Where the predicted increase in traffic flow from the Proposed Development is lower than the thresholds, the significance of the effects can be considered to be low or not significant, and no further assessments are required. Where the traffic associated with the Proposed Development will result in the above thresholds being exceeded, further assessment will be completed to identify the magnitude and significance of any resulting effects.

The implementation of the Proposed Development is likely to be phased and as such, the potential effects of AIL movements (although relatively low) would be spread over the implementation period. The IEMA guidelines state that if frequent abnormal load movements are required, consideration should be given to whether '*...other traffic impacts could be induced (e.g. fear, intimidation, driver delay etc.)*'. Interpretation of this guidance is that where there are not frequent AIL movements, these other traffic impacts would not require assessment. As the AIL movements to the Site for each turbine will be limited in number and over short durations, assessment of these other potential traffic impacts would not be required for the Proposed Development.

The movement of the AILs would require prior coordination under the Electronic Service Delivery for Abnormal Loads (ESDAL) system with National Highways, relevant Highways Authorities and the constabularies of Essex and Kent; these loads would all be escorted, and it is likely that they would be undertaken during times when background traffic flows are lowest.

The principal potential consideration associated with AIL movements is confirmation of any constraints to the movement of wind turbine component loads due to highway geometry, adjacent buildings or street furniture.

13.3.2 General Construction Traffic

There will be additional general construction traffic HGV movements, including deliveries of concrete for the turbine foundations. It is envisaged that this will be delivered as ready mixed concrete (RMC) and whilst a plant for this has not been selected at this stage, there is a potential supplier of RMC within the Northfleet Industrial Area approximately 800 metres southwest of the Site. If this local plant was used to supply RMC, this would minimise the travel distance for this material and associated additional HGV movements on other local roads to the south of the Site. On a precautionary basis, it has been assumed that RMC and other general construction materials would need to be sourced from a wider geographic area within north Kent. Whilst it is anticipated that there would be no increases in total or HGV traffic flow from general construction traffic that would exceed the aforementioned IEMA guidance thresholds, at the current stage of assessment, this cannot be confirmed.

Construction personnel are envisaged to travel to the Site in cars or light vans and they will be encouraged to car share where appropriate; the nature of the construction work for installation of the Proposed Development is such that there would be a small construction workforce. In the context of the available information on baseline flows for the local highway



network, there would be no significant envisaged effects associated with construction personnel trips.

13.3.3 Operational Traffic

Once the Proposed Development is operational, there will be no regular traffic movements required. There will be periodic maintenance visits; these will involve very small numbers of vehicle movements, the impact of which compared to background traffic flows will be imperceptible.

13.3.4 Decommissioning Traffic

Traffic movements during the decommissioning phase will be associated with the movement of materials generated by the dismantling of the wind turbines, the breakup of any foundations (if not left in-situ), and removal of other infrastructure as deemed necessary. Traffic movements during the decommissioning phase are likely to be similar to the levels arising during the construction phase of the Proposed Development.

Potential significant effects, and hence topics proposed for inclusion within the scope of the ES are set out in **Table 13-2**. Residential receptors are all considered to be of 'high' sensitivity to change.

Table 13-2: Summary of potential significant effects – Traffic and Transportation

Effect	Receptor importance / sensitivity	Envisaged magnitude of change	Potential to be significant and included in the EIA scope
Effect of AIL movements on highway or junction capacity due to volume of traffic	Medium	Small	No – not included
Effect of AIL movements on driver and pedestrian delay	Medium to High	Small to negligible	No – not included
Effect of highway geometry, adjacent buildings and street furniture on AIL movements	Medium	Medium	Yes - included
Effect of general construction HGV movements on highway or junction capacity	Medium	Small	Yes - included
Effect of general construction movements on driver and pedestrian delay	Medium to High	Small to negligible	Yes - included
Effect of traffic movements associated with construction personnel	Medium	Small	No – not included
Effect of operational traffic movements on highway or junction capacity and driver/pedestrian delay	Medium to High	Negligible	No – not included

13.4 Assessment Methodology

13.4.1 Proposed study area extent

The proposed study extent area will be based on the potential route from the Port of Tilbury to the Site. The sections of this route from the A2 to the Site are also likely to be the



principal route for general construction traffic movements. Sensitive receptors will be identified including residential areas and schools along the proposed route. Other non-residential properties such as businesses (café, shops) and health centres along the delivery route will also be considered as sensitive receptors.

An Abnormal Load Route Assessment (ALRA) will be prepared during the EIA process and will be submitted as a technical appendix to the ES, with the findings from the ALRA considered within the Traffic and Transportation chapter of the ES. As such, the ALRA will focus on ensuring that these elements can be transported to the Site, while the ES will principally consider the impacts associated with the transport of all construction materials, structures and plant required during construction of each element of the Proposed Development.

13.4.2 Legislation, standards and guidance

Principal guidance to be used within the assessment will be The Environmental Assessment of Traffic and Movement, Institute of Environmental Management and Assessment (IEMA), (2023).

13.4.3 Approach to the baseline assessment

Traffic and Transportation chapter of the ES will include a proportionate evaluation of the baseline conditions and will focus on assessing the potential impacts to arise during the construction phase of the Proposed Development.

13.4.3.1 Desk Study

The following data collection and analysis will be undertaken:

- a site visit to confirm identification of the study area and possible sensitive receptors;
- a review of available nearby development application documents including the BRM E-Scrap development and the Northfleet Harbourside development;
- analysis of traffic count data and collision data;
- assessment of traffic impacts of previous and committed local developments to understand identified effects;
- compilation of data on the number of construction vehicles and staff numbers related to each phase of the construction likely to be present on the local road network during the construction phase;
- a review of height and weight restrictions along the proposed construction transport route(s); and
- swept path analysis of the identified access options.

13.4.3.2 Field Surveys

It is common practice for traffic surveys to be commissioned in order to provide a baseline situation for traffic flows, movements and speeds. Where suitable published Department of Transport traffic flow data is not available, an Automatic Traffic Counter (ATC) survey will be commissioned on relevant highway links to collect data for 24 hours a day across a seven-day continuous period. The traffic data collected will provide classified and directional traffic flow data. Speeds will also be recorded in order to determine the 85th percentile speeds. ATC points will be considered in consultation with Highway Authorities.



13.4.4 Assessment of impact

The assessment will first calculate the traffic generation associated with the construction phase. This will include an abridged construction works programme, details of vehicle types and sizes to be used during the construction phase, and an estimate of the number of trips anticipated to be generated by HGVs, LGVs and light vehicles. Specifically, the assessment will include the following:

- a review of the construction programme to confirm the key traffic generating activities;
- compilation of data on the number of daily vehicle trips to be present on the roads within the study area, and identification of the likely maximum or worst-case scenario;
- a review of the ALRA and an assessment of the possible impacts associated with the transport of abnormal loads;
- a comparison between likely traffic flows on potentially affected roads against the baseline situation for a future year scenario with and without the Proposed Development, reported as percentage increases; and
- identification of the impacts.

The IEMA guidance (2023) will form the basis on which the effects of traffic during the construction phase will be assessed. Based on the IEMA guidance, the factors identified as being the most discernible potential environmental effects likely to arise from changes in traffic movements have been set out below and, subject to the proportion of construction traffic compared to the identified baseline and the aforementioned IEMA screening criteria, will be considered in the assessment as potential effects which may arise from changes in traffic flows from the Proposed Development.

- severance of communities – severance is the perceived division that can occur within a community when it becomes separated by major transport infrastructure separation of people from places and other people;
- road vehicle driver and passenger delay – traffic delays to non-development traffic which may occur at various locations depending on the type and scale of development;
- pedestrian and non-motorised user delay – possible delays and increased severance to non-motorised users of the roads affected, predominantly related to the crossing of roads;
- non-motorised user amenity – the impact to the ‘pleasantness’ of a journey, taking into account pedestrian fear and intimidation; and
- road user and pedestrian safety – the potential effect on road users, but in particular more vulnerable users of the road (e.g. pedestrians/cyclists).

13.4.5 Assessment of significance

The significance of any resulting effects will then be assessed in accordance with the criteria set down in IEMA guidance (2023), based on the sensitivity of receptors and the magnitude of the impacts. The potential sensitivity of the receptors to changes in traffic levels would be determined by considering the study area and presence of receptors in relation to each potential impact. The receptors would be assessed individually to determine its sensitivity and the assessment criteria is set out in **Table 13-3**.



Table 13-3: Traffic and Transport Receptor Sensitivity

Receptor Sensitivity	Definition
Very High	Receptor with no capacity to accommodate a particular effect and no ability to recover or adapt.
High	Receptor with very low capacity to accommodate a particular effect with low ability to recover or adapt.
Moderate	Receptor with low capacity to accommodate a particular effect with low ability to recover or adapt.
Low	Receptor has some tolerance to accommodate a particular effect or will be able to recover or adapt.
Negligible	Receptor is generally tolerant and can accommodate a particular effect without the need to recover or adapt.

Assessment criteria for magnitude of impact in **Table 13-4** are for guidance only and may not be appropriate for all impacts. For example, an impact may occur in a very localised area but at very high frequency / intensity for a long period of time. In such cases expert judgement will be used to determine the most appropriate magnitude ranking and this is explained through the narrative of the assessment.

Table 13-4: Traffic and Transport Impact Magnitude

Magnitude of change	Definition
Large	Impact occurs over a large spatial extent resulting in widespread, long term or permanent changes in baseline conditions, or affecting a large proportion of receptor population. The impact is very likely to occur and /or will occur at a high frequency or intensity.
Medium	Impact occurs over a local to medium extent, with short to medium term change to baseline conditions, or affecting a moderate proportion of receptor population. The impact is likely to occur and/ or will occur at a moderate frequency or intensity.
Small	Impact is localised and temporary or short term, leading to detectable change in baseline conditions, or noticeable effect on small proportion of receptor population. The impact is unlikely to occur or may occur but at low frequency or intensity.
Negligible	Impact is highly localised and short term with full rapid recovery expected to result in very slight or imperceptible changes to baseline conditions, or receptor population. The impact is very unlikely to occur and if it does will occur at very low frequency or intensity.
No change	No change from baseline conditions.
Positive	Where the proposals result in an improvement to baseline conditions.

Sensitivity and magnitude of change as assessed under the criteria detailed above would then be considered collectively to determine the significance of effect, as described in **Table 13-5**. The collective assessment is a considered assessment by the assessor, based on the likely sensitivity of the receptor to the change (e.g. is a receptor present which would be affected by the change), and then the magnitude of that change. Effects of 'major' and 'moderate' significance are considered to be 'significant' in terms of the EIA Regulations.



Table 13-5: Traffic and Transport Significance of Effects

Significance	Definition
Major	Where the magnitude of the impact is Large, and the receptor has no ability to accommodate the change. Permanent mitigation measures may be required
Moderate	Where the magnitude of the impact is Medium or for higher magnitudes the receptor has a limited ability to accommodate the change. Short term mitigation may be required.
Slight	Where the magnitude is Small or, for higher magnitudes, the receptor has the ability to accommodate the change. No mitigation measures are required.
Negligible	Where the magnitude of the impact is Negligible. No mitigation measures are required.

13.4.14 Determination of mitigation

Mitigation measures to alleviate projected traffic effects arising from the construction traffic will be identified, with the aim of reducing the predicted effects of the vehicle movements identified. These measures can be secured and implemented through a Construction Traffic Management Plan (CTMP).

13.5 Summary of the Proposed Methodology

A summary is provided in **Table 13-6** of the proposed geographical scope of assessment, scenarios to be assessed and principal technical guidance applicable to this topic within of the ES.

Table 13-6: Summary of proposed methodology – Traffic and Transportation

Aspect	Proposed approach
Geographical scope / study area	Assessment over the extent of the proposed wind turbine delivery route from the Port of Tilbury to the Site
Scenarios to be assessed	2025 baseline
	Construction Phase impacts
	2031 completed development
Principal technical guidance to inform the assessment within the ES	<i>The Environmental Assessment of Traffic and Movement</i> , Institute of Environmental Management and Assessment (IEMA),(July 2023).



14.0 Cumulative Effects

The effects of the Proposed Development in combination with other schemes that are either operational/constructed, consented, or for which planning permissions are currently being sought, will be assessed within the ES where appropriate. Cumulative effects will be considered on an issue-by-issue basis and for some topics there may not be a requirement to assess cumulative effects.

The assessment of cumulative effects within the ES will be based on the assessments undertaken within the EIA for the Proposed Development and, where available, the respective planning application documentation and Environmental Statements prepared for the other developments. This assessment will therefore be limited to information that is publicly available on other developments.

An overview of each of the cumulative developments will be provided initially to identify the topic areas within each of the developments where significant cumulative effects may or may not be likely. The assessment of likely significant cumulative effects will follow the same principles as used within the main impact assessment, being based wherever possible on the known sensitivity of receptors, predicted scale or magnitude of change and resultant significant effects.

Where there are no significant predicted residual effects for ES topics for the Proposed Development, it is considered unlikely that there would be potential for significant cumulative effects with other developments. However, these topics will be included within the assessment to determine whether the incremental impact of the Proposed Development could lead to significant cumulative effects with other development.

By definition, where EIA has not been required for another development for which a planning application has been submitted (or where a formal EIA Screening Opinion has been provided to confirm that EIA is not required), it is reasonable to conclude that the planning authority has previously considered that the development is not likely to have significant environmental effects. Where there are no significant residual effects predicted for other developments and no significant predicted residual effects for the Proposed Development, it is considered unlikely that there will be any significant cumulative effects for that topic area. Consideration will however be given on a case-by-case basis to potential for non-significant effects at individual development level combining to result in a significant cumulative effect.

Initial sites considered within the scope of the cumulative effects assessment across all topics in the ES are summarised in **Table 14-1**. Topic-specific Landscape and Visual cumulative wind turbine assessment is also proposed within 20-kilometres (12.5 miles) of the Site, as described in Chapter 10 of this Request. The existing turbines at the Port of Tilbury are also included in the multi-topic cumulative assessment due to the potential cumulative noise impact discussed in Chapter 11 of this Request.

Table 14-1: Proposed cumulative assessment sites

Plan Ref	Site Name	Planning Application Reference and status	Summary description
1	Port of Tilbury Wind Turbines	07/01328/TTGFUL Operational	Installation of four wind turbines with hub heights of 80 metres and blade heights of 46.25 metres with associated switch rooms.
2	Northfleet Harbourside	2022/1064	Outline planning application with all matters reserved, except for the primary means of access and road layout, for a phased mixed-use redevelopment involving the demolition of existing buildings and



Plan Ref	Site Name	Planning Application Reference and status	Summary description
		Resolution to grant outline planning permission	structures including site preparation / remediation works, and the development of residential units (Use Class C3), Class E uses including floorspace for retail Class E(a)), food/beverage and drinking establishments (Use Class E(b)), local services (Use Class E(c)), indoor sport/recreation/fitness (use Class E(d)), healthcare space (Use Class E(e)), creche/nursery uses (Use Class E(f)), office floorspace (Use Class E(g)(i)), a new multi-use stadium with associated business and leisure facilities (sui generis), hotel (Use Class C1), community uses floorspace (Use Class F2). The phased redevelopment will include other sui generis uses, delivery of open space and significant realignment of the road network including the A226 Galley Hill Road / Stonebridge Road / Lower Road with hard / soft landscaping, car and cycle parking provisions, infrastructure works, ancillary and associated works.
3	BRM E-Scrap Facility	KCC/GR/0050/2023 Approved and under construction	Development of an enclosed electronic waste (E-Scrap) transfer facility, involving shredding, sampling, sorting, and bulking up of electronic waste streams for onward transportation to recycling/management facilities. The proposed development includes the demolition of existing buildings, construction of a new steel framed waste transfer building, firewater storage tank and associated plant, dust extraction unit, office and staff welfare building, new areas of concrete hard standing and footways, upgrade to site drainage, construction of a re-aligned access point off Manor Way and retention of vehicular access to the adjacent wharf



15.0 Proposed Structure of the Environmental Statement

The ES will be divided into three volumes. Volume 1 will be the main part of the ES and, based on the preliminary conclusions of this report will be structured as follows:

Table 15-1: Proposed ES structure

Chapter	Chapter title	Summary content of the chapter
1	Introduction	Provides project background and context, an explanation of EIA and the EIA Regulations, a description of the structure of the ES etc.
2	EIA methodology	Describes the methodology employed throughout the EIA process (including scoping and public consultation etc.) and the ES (including the derivation of significance etc.).
3	Site description	Provides a description of the existing land uses within the Site and within the wider study area to place the Proposed Development in the wider context.
4	Description of the Proposed Development	Provides a full description of the scale and nature of the Proposed Development. This description will be informed using a series of planning application drawings, on which the topic-specific impact assessments will be based.
5	Alternatives considered and design evolution	Will describe the alternatives that have been considered by the Applicant and the main environmental reasons for the decisions made during the evolution of the Site design.
6 to 13	Topic-specific chapters	Provides detailed assessment of each of the topics for which significant effects are likely. Based on this Scoping Opinion Request these are proposed as: 6. Communications 7. Terrestrial and Aquatic Ecology 8. Heritage 9. Ground Conditions and Groundwater 10. Landscape and Visual Impact 11. Noise 12. Ornithology 13. Traffic and Transport
14	Cumulative effects	Provides an assessment of the cumulative effects of the Proposed Development in conjunction with other developments, as agreed with GBC.
15	Summary of residual effects and mitigation	Contains an overall residual effects table to summarise the significance of impacts discussed in each of the technical chapters. A table will also be included to summarise all secondary mitigation proposed and is likely to provide the basis of the CEMP.
16	Glossary	Alphabetic explanation of technical terms and abbreviations used within the ES.

Each technical chapter of the ES (Chapters 6 – 13) will be structured in a consistent format as follows:

- Introduction
- Legislation, policy and guidance



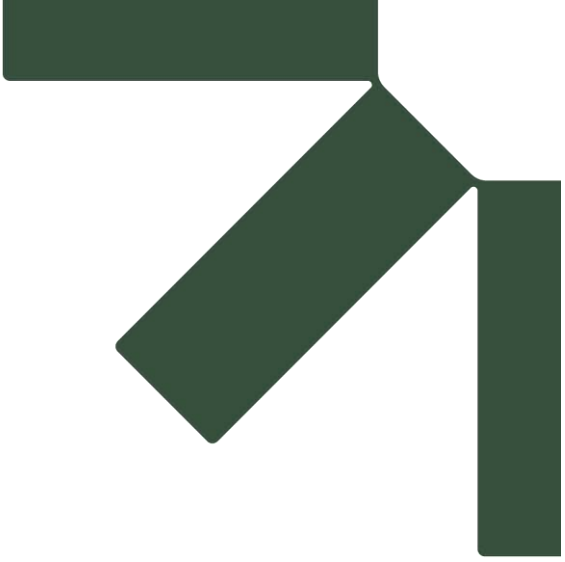
- Methodology
- Baseline conditions – including future baseline
- Summary of relevant primary mitigation
- Assessment of construction impacts
- Assessment of operational impacts
- Mitigation measures
- Residual impacts.

Volume 2 will contain the technical appendices that have informed the chapters contained within Volume 1. This will include documents such as the Ecological Baseline Assessments, Noise Baseline Assessments, and Historic Environment Desk Based Assessment.

Volume 3 will be the Non-Technical Summary of the information provided in Volume 1. Its purpose is to provide an overview of the Proposed Development and its impacts on the environment for non-specialists.

The consideration of the potential and likely main / significant effects in this Scoping Opinion Request is preliminary. In accordance with the requirements of the EIA Regulations, copies of this Scoping Opinion Request will be distributed by GBC to a range of statutory consultees and interested parties. Comment is invited over a statutory five-week period, after which the responses will be reviewed and included in the formal GBC Scoping Opinion, which will be used to inform the EIA process for the Proposed Development.





Appendix A Schedule 4 of the EIA Regulations 2017 (as amended)

Request for an EIA Scoping Opinion

Britannia Refined Metals Wind Energy

Britannia Refined Metals

SLR Project No.: 404.063945.00001

20 February 2025

Schedule 4

Information for inclusion in Environmental Statements

1. A description of the development, including in particular:
 - a) a description of the location of the development;
 - b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
 - c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
 - d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.
2. 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.
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof 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.
4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.
5. A description of the likely significant effects of the development on the environment resulting from, inter alia:
 - a) the construction and existence of the development, including, where relevant, demolition works;
 - b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
 - c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

- d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
- e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
- f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
- g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC and Directive 2009/147/EC.

6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or UK environmental assessments 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.

9. A non-technical summary of the information provided under paragraphs 1 to 8.

10. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.



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