



Grain to Tilbury

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Landscape and Ecological Management Plan (LEMP) – Gravesham Borough Council Planning

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1 Overview

1.1 Introduction

The Grain to Tilbury tunnel replacement project (the Project) involves the replacement of the existing 1960s Thames Cable Tunnel beneath the Thames between Tilbury and Gravesend. The existing tunnel was built in 1969 and houses 400 kilovolt (kV) transmission cables as part of National Grid's high voltage transmission network.

The Project was formally granted planning permission by Gravesham Borough Council on the 4th March 2025. The Project will be approximately 2.2km long and able to accommodate the installation of new cabling, and the construction of two headhouses at either end of the tunnel, enabling National Grid to strength the network to power all homes and businesses with green energy by 2030.

National Grid (NG) has appointed FBJV as the Design and Construction (D&C) Contractor responsible for undertaking the detailed design and construction of the Project all in accordance with the constraints and parameters of the Planning Permission and NG specifications. FBJV is a joint venture formed between Ferrovial Construction (UK) Ltd and BEMO Tunnelling GmbH.

1.2 Purpose

This Landscape and Ecological Management Plan (LEMP) will provide detail to satisfy associated planning conditions stipulated by the local planning authority within the Decision Notice reference 20231313, dated 4th March 2025.

The LEMP has been developed in accordance with the Outline Landscape Ecology Management Plan (OLEMP) prepared as part of the planning permission by AECOM on behalf of NG (latest revision July 2024).

This plan is the first iteration of two submissions. Where detail provided in this submission is preliminary or outline, it will be updated following completion of the relevant detailed design and then submitted within an amended 'second submission LEMP'. This two submissions strategy allows appropriate opportunity for iterative design development, including alongside key consultees. The content of each of the two LEMP submissions is provided within Table 2.

2 Planning

2.1 Aims and Objectives

This LEMP aims to identify key landscape and ecological resources at the site (retained, newly created and enhanced) and describe how these will be protected, created, and enhanced during the construction of the development.

This LEMP aims to:

- i. Integrate the development into the existing landscape pattern as far as possible by retaining and following existing features, including vegetation, where practicable.
- ii. Ensure procedures are implemented to control and limit the disturbance of areas of nature conservation interest and protected species and habitats during construction.
- iii. Ensure that works undertaken during the construction phase remain compliant with wildlife legislation, regulations and good practice;

- iv. Ensure that the ecological protection measures are implemented;
- v. Provide a document for consultation with the relevant statutory authorities as appropriate;
- vi. Replace habitat lost because of construction of the development and introduce new habitats through areas of new planting and habitat creation; and
- vii. Facilitate an effective ecological monitoring regime.

2.2 Roles and Responsibilities

The FBJV Project Director is responsible for the implementation of landscape and ecology management during the construction of the development. Many members of the FBJV also have responsibility for elements of landscape and ecology management appropriate to their function, experience and seniority. The FBJV Ecological Clerk of Works (ECoW) will lead on ecology management and act as the key advisor on all related matters including compliance with the plan.

Table 1 provides details of the personnel working on the project with specific responsibilities in relation to ecology and landscape management.

Table 1 Role and Responsibilities

Role Title	Responsibilities
Project Director	Provide adequate environmental resources and support to effectively deliver the requirements of this plan.
Project Manager	- Endeavouring compliance with the approved LEMP requirements and principles during the construction phase. - Work to aim method statements conform to the requirements of the LEMP. - Liaise with Environmental and Sustainability Manager on all environmental issues as appropriate. - Endeavour that all environmental incidents are reported to Environmental and Sustainability Manager according to agreed procedures.
Environmental & Sustainability Manager	- Develop and implement the LEMP. - Identify and maintain compliance with the requirements and principles of the LEMP during construction. - Assist lead auditors in auditing the LEMP - Identify, develop and provide environmental training as required specific to the LEMP. - Monitoring and assessing the landscape related elements of the approved LEMP for their effectiveness following commencement of operation of the development. - Liaise/meet with external stakeholders.
Ecological Clerk of Works	- Supervise key stages of both habitat clearance and habitat creation works. - Provide technical support on ecology matters and requirements for compliance with relevant legislation and protected species licenses. - Undertake/oversee site surveys and watching briefs. - Advise on ecological protection measures. - Approve method statements and consider LEMP requirements.

	Advise and instruct construction teams in the event of incidents and complaints.
Environmental Advisors	- Inspections on compliance with the LEMP requirements. - Brief LEMP requirements to relevant teams. - Advise and guide project team in the implementation of ecology protection measures. - Identify ideas for improvement to environmental manager for consideration. - Report best practice across the project. - Assist in incident investigations and reporting. - Encourage near miss reporting and identify trends.
Site Manager	- Endeavour the works are undertaken in accordance with agreed methods and briefings. - Aim significant ecological aspects identified for the Project, over which they are deemed to have influence and control, are managed appropriately. - Comply with environmental incident investigation and reporting procedures as appropriate.
All Personnel	- Carry out the works in accordance with agreed methods and briefings. - Report anything that deviates from agreed processes. - Attend Project induction.

2.3 Training and Awareness

All those working for FBJV or on behalf of the JV shall undertake an induction that includes training about the key aspects of environmental management on the project to achieve and maintain a high standard of environmental awareness and risk control and provide practical guidance for specific topics including ecological monitoring.

The construction team will be involved in the development of the LEMP and will be briefed on the final approved requirements including the results of the surveys and ongoing ecological monitoring. Environmental information on ecology will be displayed in offices, site cabins and at sensitive locations to increase awareness of specific ecology matters. The Environmental Team, the ECoW and the JV construction team will deliver ecology themed toolbox talks to site and office teams making use of best practice materials from parent companies, specialist environmental / ecological subcontractors and organisations such as CIRIA.

3 Summary of Planning Conditions Relevant to the LEMP

This document aims to address Conditions 10, 11 and 12 as contained in Gravesham Borough Decision Notice 20231313, dated 4th March 2025. Table 2 summarises the relevant planning conditions and specifies where each aspect is covered in this report, indicating the level of detail provided.

Planning Conditions 10, 11, and 12 will be partially discharged at this stage, as some elements of the detailed design and operational proposals are still under development. Table 2 details which aspects of the planning condition 11 included within each issue of the LEMP, while further details of Condition 10 and 12 are presented in the Construction Ecological Management Strategy and Ecological Design Strategy document comprised as Appendix C within this document. The LEMP will be updated in the next iteration as the specific design areas are sufficiently advanced, with the updated version to be submitted to the Local Planning Authority for approval prior to the completion of the construction phase.

The second submission of this LEMP will contain detailed proposals for:

- i. Landscape and ecological mitigation feature to be created following construction phase;
- ii. Details of treatment of operational site boundaries and/or buffers around water bodies;
- iii. Details of how any permanent proposed footpaths, fencing, lighting, and other aspects of the development may interact with the wetland or ditch habitats; and
- iv. Details of operational maintenance regimes; including specific treatment of the ditch buffer zone and new wetland habitats.

Table 2 Status of planning Conditions 10, 11 & 12 provided by Gravesham Borough

Planning condition ref.	Planning condition	Section of this LEMP	Within this First Issue LEMP?	To be within the Second Issue LEMP
10 - General	No development approved by this permission shall take place (including any site/vegetation clearance) before a construction ecological management strategy (CEMS - biodiversity) has been submitted to and approved in writing by the local planning authority. The CEMS - biodiversity shall be based on the avoidance, mitigation and compensation measures indicated within the ecological information submitted with the planning application.	Appendix C	This Document	This Document
11 - General	No development approved by this permission shall take place until a Landscape Ecological Management Plan (LEMP), including long-term design objectives, management responsibilities and maintenance schedules for all wetland and ditch habitats has been submitted to, and approved in writing by, the Local Planning Authority.	This Document	This Document	This Document
11a	Details of treatment of operational site boundaries and/or buffers around water bodies; an adequate buffer zone extent (i.e. to provide good forage and shelter for water voles) to be identified and demarked on a scaled map;	10	Yes – full details	-
11b	Details demonstrating how the buffer zone will be protected during development	10 Appendix C - Section 5	Yes – full details	-
11c	Details of how any permanent proposed footpaths, fencing, lighting, and other aspects of the development may interact with the wetland or ditch habitats; the applicant should note that artificial light spill should be directed away from ecological receptors, sensitive lighting design guidance can be accessed via the Bat Conservation Trust;	8, 9	Yes – full details	-
11d	No light spill from permanent external artificial lighting into the watercourse or adjacent river corridor habitat. To achieve this the specifications, location and direction of external artificial lights should be such that the lighting levels within 8.5 metres of the top of bank of the watercourse are maintained at background level (background levels are considered to be a Lux level of 0-2);	8	Yes – full details	-
11e	Details of maintenance regimes; including specific treatment of the ditch buffer zone and new wetland habitats;	-	-	Yes – full details
11f	Details of any new wetland and ditch habitat created on-site, including any proposed planting scheme should be provided. Planting schemes should use native species, suited to the catchment character and management responsibilities should be provided.	7, 10	Yes – outline details	Yes – confirmatory details
12	No development approved by this permission shall take place (including any site/vegetation clearance) before an Ecological Design Strategy (EDS) has been submitted to and approved in writing by, the Local Planning Authority.		n/a	n/a

Planning condition ref.	Planning condition	Section of this LEMP	Within this First Issue LEMP?	To be within the Second Issue LEMP
	- The EDS shall ensure that on-site compensatory habitat is provided for relevant protected and priority species (as determined by a suitably qualified ecologist). - The EDS shall ensure that both on and off-site compensatory habitat is provided for the projected permanent and temporary loss of reptile habitat (as identified in the AECOM Technical Note: Response to Ecological Points Raised in KCC Advice to Gravesham BC Dated 27th February 2024 (24th July 2024 Rev02). - The EDS shall ensure the mitigation and compensation measures with regards to habitat improvements proposed, and the area of land required, are based on available scientific research and government standing advice. - If the proposed compensation site already has an existing population of the relevant species and/or is already proposed as compensation for other development, evidence shall be provided to demonstrate that the measures proposed are additional.	Appendix C – Section 12 Appendix C – Section 14 Appendix C – Section 11.1		

3.1 LEMP Submission 2 Content

As identified in the table above further detail will be provided in the second submission of the LEMP. This two submissions strategy allows appropriate opportunity for iterative design development, including alongside key consultees. All information reserved to the second stage LEMP submission relates to the detailed permanent design of the project, and/or its operational proposals.

4 Landscape and Ecology Resources

A detailed site description is set out in the Environmental Statement (ES) which combined the northern and southern parcels to provide a wider context of the entire development site. Ecological surveys were carried out from October 2022 to September 2023 at the proposed development across the development site (Volume IV Chapter 15 Biodiversity and 16 Landscape and Visual in Gravesend as well as various appendices).

Additional confirmatory ecological surveys are being conducted in 2025 to record any significant changes to the baseline. The surveys executed to date have been consistent with the ES.

Landscaping and terrestrial survey data has been used in the OLEMP to identify existing on-site and nearby designated sites, and to determine the existing nature of the ecological resources within the order limits, specifically habitats and protected species.

4.1 Existing Site Description

The Gravesend site comprises a permanent footprint of approximately 230 m² located within a vegetated area which is part of the Canal and Grazing Marsh, Higham Local Wildlife Site (LWS), designated for its grassland habitats and on land owned by National Grid at approximately TQ 67455 74158 and a temporary footprint of approximately 3.71 ha.

To the north of the site boundary, is the existing cable tunnel and associated headhouse and Sealing End Compound (SEC). The land immediately east is owned by the Royal Society for the Protection of Birds (RSPB) Rainham Marshes and is partially leased and used as a Police Training Centre for rifle shooting. The land immediately west comprises of the Thameside Campus (National Maritime Training Centre), Metropolitan Police Specialist Training Centre (MPSTC) and Thames and the Medway Canal Association.

4.2 Statutory and Non statutory Site

The Gravesend site is not located within any statutory designated sites for nature conservation. Land approximately 30m to the south of the Gravesend Site forms part of the Thames Estuary and Marshes Site of Special Scientific Interest (SSSI) and Ramsar site, designated sites of international importance. The SSSI/Ramsar consists of a mosaic of grazing marsh, saltmarsh and ditches that are internationally important for the diverse assemblage of birds they support, and also of value for notable plants and invertebrates.

The Gravesend site is located within the wider Thames Estuary South Important Invertebrate Area, Canal and Grazing Marsh, Higham LWS which incorporates managed and unmanaged coastal and floodplain grazing marsh, salt marsh, reedbed and a long stretch of the Thames and Medway Canal. The LWS supports good populations of reptiles, bats as well as bird and invertebrate assemblages. The LWS is of County importance.

The nearest National Landscape is the Kent Downs located approximately 3km south of the Gravesend site. Neither site or their respective study areas are within a National Park and there

are no Registered Parks or Gardens.

4.3 Existing Landscape Features

The Gravesend site is situated to the east of Gravesend on an area known as the East Court Marshes. Adjacent to an industrial area that forms a narrow strip between the River Thames and the Thames and Medway Canal, the site is approximately 750 meters from the nearest residential properties in Denton and Chalk. The rest of the surrounding area is rural, featuring scattered farmsteads and isolated properties to the southeast.

The site's landform is predominantly flat, with gradual elevation rising to about 15 meters Above Ordnance Datum (AOD) to the west toward Windmill Hill, and to approximately 20 meters AOD to the south toward Harts Hill and Shorne Hill.

There are no Public Right of Ways (PRoWs) across the site. The nearest PRoW is about 150m north, part of the England Coast Path and Saxon Shore Way (Footpath 0328/NG1/1). A public footpath along the Thames and Medway Canal (0328/NG2/2), around 150m south, is also part of National Cycle Networks (NCN) Route 1 from Dover to Scotland. Several other PRoWs run perpendicular to this route south of the site, with a bridleway east of the site. There are no areas of Registered Common Land or accessible CRoW Act Land.

4.4 Existing Terrestrial Habitats (Survey 2022 - 2023)

This section reviews and summarises the existing terrestrial habitats. It is based on the habitat surveys conducted between October 2022 and September 2023:

4.4.1 Existing Terrestrial Habitat

With the exception of the existing Gravesend SEC, the majority of the Site is identified within Natural England's Priority Habitat Inventory as Coastal and Floodplain Grazing Marsh. Grazing marsh is defined as 'periodically inundated pasture, or meadow with ditches which maintain the water levels, containing standing brackish or fresh water. The ditches are especially rich in plants and invertebrates. Almost all areas are grazed and some are cut for hay or silage'. As such it is a habitat type defined in part by the presence of suitable hydrological and topographical conditions rather than strictly the botanical communities present.

The pony grazed grasslands in the west of the Site currently have the greatest diversity in both species composition and structurally, based on the marginal areas of longer grassland, tall ruderal and scrub. The grazed grassland areas showed greatest affinity with the National Vegetation Classification (NVC) community MG6 *Lolium perenne* – *Cynosurus cristatus* grassland, with some species indicating previous flooding with brackish water, and some areas of bare ground around entrances/feeding areas. The sward was dominated by creeping bent (*Agrostis stolonifera*), with frequent meadow barley (*Hordeum secalinum*), perennial rye-grass (*Lolium perenne*), common couch (*Elymus repens*) and white clover (*Trifolium repens*). With occasional species including sea beet (*Beta vulgaris subsp. maritima*), hoary cress (*Lepidium draba*) and spear-leaved orache (*Atriplex prostrata*).

In small patches of slightly raised ground within these fields there are small areas of NVC community MG1a *Arrhenatherum elatius* grassland – *Festuca rubra* subcommunity grassland with cock's-foot (*Dactylis glomerata*), soft brome (*Bromus hordeaceus ssp hordeaceus*), hoary cress, yarrow (*Achillea millefolium*), ribwort plantain (*Plantago lanceolata*), common couch and red fescue (*Festuca rubra agg*). At the margins of the fields and scattered through the shorter grazed grassland in the two smaller southern fields are longer sward areas containing frequent false-oat grass, and locally frequent tall ruderals including common nettle (*Urtica dioica*), hemlock (*Conium maculatum*) and creeping thistle (*Cirsium arvense*). In addition, there were

occasional stands of mixed scrub including hawthorn and bramble.

Fields to the south of the Milton Rifle Range support unmanaged species poor grassland. The easternmost section which includes the existing pylon and immediate surrounds showed the closest affinity to the NVC community MG1b *Arrhenatherum elatius* grassland – *Urtica dioica* subcommunity. This area comprises species poor tall unmanaged grassland with false oat-grass common couch, common nettle and cleavers (*Galium aparine*).

The MG1b habitat transitions to the north to NVC community S4 *Phragmites australis* swamp and to the west into areas dominated by tall ruderals, including creeping thistle (*Cirsium arvense*) and hemlock (*Conium maculatum*).

Brackish water filled drains are present throughout the Gravesend Site. These are fringed with common reed, bulrush (*Typha latifolia*) sea club-rush (*Bolboschoenus maritimus*), sea aster (*Aster tripolium*) and celery leaved buttercup (*Ranunculus sceleratus*). The drains are adjoined by stands of scrub dominated by bramble and hawthorn.

Within the Rifle Range the habitat varies between areas of short sward species poor amenity grassland managed for the shooting operation, and surrounding areas of largely unmanaged grassland containing frequent false oat-grass (*Arrhenatherum elatius*) and cock's-foot (*Dactylis glomerata*) with occasional herbaceous species.

4.4.2 Species

The Gravesend site is known to support a range of protected and/or notable species as follows:

- i. Bats: the Site does not support roosts but is of value for local bat populations foraging/commuting;
- ii. Birds: the Site supports a diverse range of breeding bird species including the specially protected Cetti's warbler (*Cettia cetti*) but surveys suggest it is not of significant value for the species for which the nearby Thames Estuary and Marshes SPA/Ramsar is designated;
- iii. Great crested newt: are assumed absent due to brackish water in ditches;
- iv. Reptiles: the Gravesend Site supports a 'good' population of slow worm and low populations of grass snake and common lizard;
- v. Invertebrates: a diverse assemblage of County importance was identified, including four Species of Principal Importance namely brown-banded carder-bee (*Bombus humilis*); shrill carder-bee (*Bombus sylvarum*); hornet robberfly (*Asilus crabroniformis*) and small heath butterfly (*Coenonympha pamphilus*). In addition, phoenix fly (*Dorycera graminum*) is considered very likely to occur, and wall butterfly (*Lasiommata megera*) is considered possible to occur.
- vi. Water vole: the ditches have previously been found to support populations of water vole and it is assumed they continue to be present. It should be noted that the water vole surveys undertaken for the development found no evidence of water vole.

4.5 Confirmatory Ecological Baseline (Survey 2025)

4.5.1 Reptiles

Survey conducted previously identified the site as being suitable for common reptile species. The recent survey confirmed the site remains suitable for reptiles. Three species were recorded

on site, including grass snake, slow worm and common lizard. There is confirmed a low population of common lizard and grass snake on site with a medium population of slow worm.

4.5.2 Water voles

A previous assessment identified that the ditch supported a population of water voles, and the current survey confirmed their presence across the ditch. The survey is scheduled to be completed in September.

4.5.3 Badgers

During 2025 survey no badger setts were identified within the site, confirming AECOM's 2023 survey within 1km of the site.

4.5.4 Invertebrate Surveys

Confirmation of invertebrate baseline will be taken on at the optimal period of time (between May and mid-September). Survey will be undertaken in July.

5 Landscape and Ecology Management

Good design has been a key consideration from the outset developed in response to policy requirements, published landscape character assessment guidance and fieldwork analysis. The overall objective is to avoid or minimise adverse landscape, ecological features, reduce habitat losses and visual effect as far as practicable, while maximising opportunities to deliver net gains in biodiversity.

5.1 Measures to Protect and Minimise Construction Impact

This section of this LEMP details the management measures needed to protect and minimise any impacts arising from construction activities. Generic best practice construction measures will be implemented throughout the site and in accordance with the Construction and Environment Management Plan (CEMP). The CEMP includes, but is not limited to the following measures to minimise impacts from construction:

- i. Dust attenuation and pollution prevention measures following [Environment Agency Guidelines](#);
- ii. Protective hoarding erected to reduce disturbance associated with noise, vibration and lighting to adjacent habitats and species;
- iii. Implementing and maintaining construction exclusion zones / buffer zones around sensitive habitats and species; and
- iv. Other relevant measures included within the CEMP.

5.2 General Environmental Measures

The general measures detailed below will be implemented to reduce construction impacts:

- i. Completion of a walkover prior to construction works to reconfirm the ecological baseline conditions and to identify any new ecological risk by the ECoW. The walkover will be completed sufficiently far in advance of the works to allow for the completion of any additional, seasonally constrained survey that may be required.

- ii. Ongoing pre-construction surveys and monitoring will ensure the ecological baseline of the site and ecological requirements are current and relevant. Any changes in the baseline of the site recorded during the pre-construction surveys or monitoring will feed into the LEMP. Further details on monitoring requirements are provided in the relevant sections of this report.
- iii. All site staff will be informed about the species and habitats that may be present on site via toolbox talks provided by the ECoW.

Toolbox talks will be tailored to the specific ecological issues relevant to the site, and will focus on sensitive receptors, their characteristics and mitigation requirements.

- i. The ECoW must be present onsite during the clearance of vegetation if it's undertaken during the active ecology season or for works with potential to impact sensitive ecological receptors, further details are provided in the Site Clearance Plan. This LEMP details which construction activities will require an ECoW to be present. Ecological calendar is included in

- ii. [Appendix A](#).
- iii. Site clearance will take account of seasonal constraints and will be undertaken in accordance with best ecological practice. Prior to any tree felling works the ECoW would undertake an updated bat roost suitability assessment, and where necessary make recommendations for further surveys or supervision to ensure no adverse effects on roosting bats.

5.3 Protected Species

Measures to protect protected species located close to or adjacent to the proposed development from impacts such as dust attenuation, light spill and pollution prevention guidelines will be within the CEMP and other specific management plans where relevant.

5.4 Habitats

The measures detailed below will be implemented to prevent construction impact to habitats:

- i. Where practicable find opportunities to reduce the loss of semi-natural habitats during the works i.e. retaining appropriate buffer zones around ditch habitat (minimum of 5m) and/or where possible retaining trees or scrub on the boundary of the site. The location of these is identified within the Arboricultural Impact Assessment (AIA) submitted with the Environmental Statement).
- ii. Temporary displacement of faunal species associated with these habitats for the duration of the construction, but ensure adjacent populations remain present and suitable to naturally recolonise the Site when construction is completed.
- iii. Provide compensatory area of habitat creation that are of equal or higher value than those lost.
- iv. Integration of the local green infrastructure network, improving ecological connectivity cross the sites. Planting and design layout will be reflective of the Natural England Coastal floodplain and grazing marsh priority habitat. The planting design will seek to strengthen connections to the priority marshland at Tilbury and Gravesend.
- v. Where works near retained trees cannot be practicably avoided, these works will be undertaken in accordance with current best practice at the time of the works. Appropriate protection measures are detailed within the AIA submitted within the planning application. Any such works will be undertaken in accordance with a site-specific Arboricultural Method Statement and under the supervision of an appropriately trained and experienced specialist.

6 Ecological Monitoring

6.1 Guidance on Ecological Data Validity

The Chartered Institute of Ecology and Environmental Management (CIEEM) identifies that the validity of survey data, depends on the species being surveyed, and that survey data is typically valid for approximately 18 months – 3 years. Survey data may be valid for a shorter period of time than this under the following circumstance:

- i. Where a site may offer existing or new features which could be utilised by a mobile species within a short timeframe e.g., bat roosts;

- ii. Where a mobile species is present on site or in the wider area, and can create new features of relevance to the assessment e.g. badgers; and/or
- iii. Where species specific guidance dictates that additional surveys are required

If data does not meet these exemptions, then it may be valid for up to three years. The guidance states that if more than 18 months elapses, it is recommended that an ecologist will need to undertake a site visit and may also need to update the desk study information for the development. The ecologist would then review the validity of the report/survey effort and advise on frequency of re-survey.

6.2 Construction Phase Monitoring

To ensure compliance with ecological regulations and to monitor the impact of the construction activities on the local environment, a comprehensive calendar of surveys is implemented. These surveys will be conducted at various stages of the pre-construction phase:

- i. Initial habitat assessment and baseline species survey to identify existing ecological features and species present on site.
- ii. Follow-up surveys to monitor any changes in species presence and habitat conditions. This will also involve specific surveys for nesting birds during the breeding season.
- iii. Invasive species survey to detect and plan for the management of any non-native species that could affect the construction activities.
- iv. Final pre-construction survey to update the ecological baseline data and ensure all protective measures are in place before construction begins.

Table 3 Indicative Pre-Construction Phase Monitoring Calendar

Programme	Jan	Feb	Mar	Apr	May	June	July	Aug
Reptile survey updates								
JNNS/Notable & Rare Plant Survey**								
Badger survey update 2025								
Water vole update 2025								
Bird survey update 2025								
Tree Survey**								
Invertebrate								

6.3 Operational Phase Monitoring

National Grid will identify the scope and frequency of ecological monitoring required, including those for invertebrate species. The operational phase of monitoring will be confirmed in the second submission of the LEMP prior to construction of the development is completed.

7 Preliminary Landscape Design

7.1 Introduction

The layout of the Proposed Development has been designed to minimise the loss of, and avoid significant impacts to, existing landscape features. This includes minimal disturbance of existing vegetation by prioritising use of existing hard standing areas where feasible.

The OLEMP provides an outline landscape description for several habitats that will be created and included in the detailed landscape design. The detailed design of all landscaping works will be presented in in the next iteration of the LEMP prior to the operation of the project. The detailed design will be provided by FB JV.

Figure 1 (full-size in [Appendix B](#)) depicts the landscape design proposed within the OLEMP.

Landscape and Ecological Management Plan (LEMP) – Gravesend Borough Council Planning

July 2025

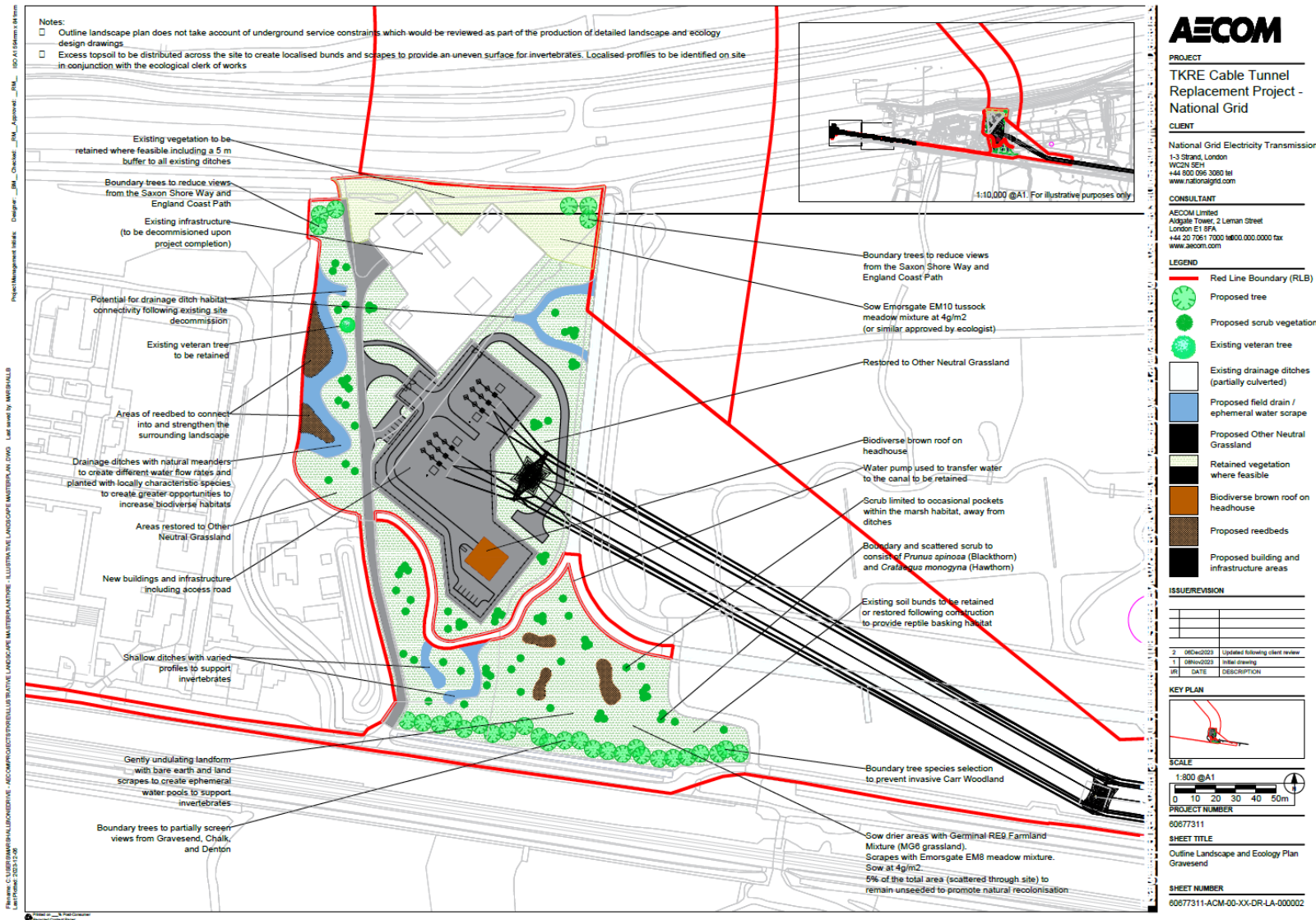


Figure 1 Outline landscape and ecology plan - Gravesend (Source AECOM OLEMP submitted for planning permission).

Ref.: GRR-FBJ-PM-GRRS4-ZP-ZE-000002 Ver. P04

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7.2 Post Construction Management of Newly Created And / Or Enhanced Habitats

The post construction landscape maintenance and monitoring regimes for establishment maintenance (0-5 years), medium management (5-10 year) and the long-term management prescriptions will be provided in submission 2 of the LEMP. These will be defined during detailed design of the landscape design.

Landscape management and monitoring activities will be provided by National Grid.

7.3 Existing Trees and Vegetation

Existing trees and vegetation that will be retained during the construction phase will be managed in accordance with the requirements detailed in the planning application AIA.

One veteran tree has been identified within the extents of the Gravesend site. This is referenced as T139¹. As a result of its veteran status this tree will be retained within the site extents during the construction phase. The tree and its associated root protection area will be protected from construction impacts through implementation of the measures outlined in Appendix E of the AIA.

T139 has been classed as possessing high suitability to support roosting bats. Measures to protect this tree during the construction phase will be to include the implementation of a buffer to exclude construction activities and ensure that temporary lighting is directed to avoid illuminating this tree.

Tree protective fencing will be installed under the supervision of the Arboricultural specialist and subject to regular monitoring by the site JV Environmental team to ensure it remains in position and is fit for purpose.

Where works are planned within a defined tree root protection area, a comprehensive Method Statement will be developed and strictly followed to ensure minimal impact.

Preliminary management recommendations for existing trees are detailed within the tree survey schedule (*Appendix B of the AIA*).

All tree and vegetation pruning works will be undertaken outside of the bird nesting season unless supervised by the ECoW. The bird nesting season is the period from 1st March to 31st August.

All tree and vegetation clearance works will adhere to a Permit to Clear process and be appropriately timed to avoid environmentally sensitive time frames and supervised to minimise impacts to sensitive ecological receptors.

All site clearance works will occur under a Precautionary Method of Working (PMoW).

7.4 Individual Tree Planting

Individual trees will be planted along the boundary of the Gravesend site.

Mature trees are not representative of the landscape character area at Gravesend.

Individual tree planting will be focused at creating strategically placed screening along the boundary of the Gravesend site that will supplement the retained individual trees. These

¹ [Arboricultural Impact Assessment \(AIA\) AECOM 2024](#)

individual trees will provide habitat diversity and tie into the industrial hinterland edge at Gravesend. Tree species will be selected to prevent wet woodland / woodland carr development.

Figure 1 provides the proposed location of individual tree planting. However, this may be subject to change following the development of the detailed landscape design. This plan will be updated to reflect any such changes.

FBJV and National Grid will ensure that all detailed design information will be provided to discharge planning conditions prior to the first use of the Project.

7.5 Individual Tree Preliminary Species Composition

Tree species that are native to the area and present locally should be included in the final design. These will include but may not be limited to:

- i. *Prunus spinosa* (blackthorn)
- ii. *Crataegus monogyna* (hawthorn)
- iii. *Prunus avium* (wild cherry)

The following tree species shall be excluded from any landscape design palette due to their potential to contribute to wet woodland / woodland carr development:

- i. *Alnus glutinosa* (alder)
- ii. *Salix* species (willow)
- iii. *Betula* species (birch)

7.6 Individual Tree Preliminary Planting Specification

To comply with best practice and recommended tree and scrub planting specifications the following key working methods will be implemented. The final landscape design will provide a comprehensive planting specification which will be adhered to.

- i. Planting will occur between November and March and works will be timed to avoid periods of frost, drought or other inclement weather as far as practicable;
- ii. All planting stations will be weed free and appropriately cultivated prior to planting;
- iii. Plants will be handled, stored and planted in accordance with the requirements of BS8545, The HTA National Plant Specification and the MCHW Series 3000;
- iv. A suitable plant guard will be installed with each planted item. The type of plant guard will be suitable for the plant species and growth habit;
- v. Trees will be staked and ties installed to provide support; and
- vi. Mulch will be applied at the base of each planted item to create a 500mm radius weed free area.

7.7 Individual Tree Preliminary Management and Monitoring

The final landscape design will detail a comprehensive maintenance programme for the

establishment period (years 1 – 5 following planting). The activities detailed below are indicative of typical tree planting schemes and will be subject to change following completion of the detailed landscape design:

- i. Maintain a 1 metre weed-free circle around trees through mechanical control. Up to 2 no. visits per year;
- ii. Water new plants as required to minimise failures in periods of drought;
- iii. Remove litter, rubbish, and debris from around the trees throughout the year;
- iv. Re-firm soil around roots to ensure trees are supported and remain upright in Spring;
- v. Inspect and adjust guards, ties and stakes in Spring and Autumn and after strong wind events;
- vi. Inspect and top-up mulch as required;
- vii. Undertake any formative pruning if required;
- viii. Check and record failed or defective trees annually in September;
- ix. Replace failed or defective trees with matching species of the same size during the next planting season after failure; and
- x. Undertake annual check of trees to record their growth and condition.

Long term (greater than 5 years post planting) maintenance programmes are recommended to ensure that created habitats continue to achieve their target habitat distinctiveness and habitat condition. Long term maintenance and monitoring specification will be confirmed in the second submission of the LEMP.

7.8 Scrub Planting Overview

Scrub will be planted at a very low density across the Gravesend site.

The objective of scrub planting is to create and subsequently maintain a diverse mosaic of scrub and grassland habitat. This mosaic will provide structural and species diversity providing food and shelter for birds and other wildlife.

Wet woodland / woodland carr invasion will be prevented by traditional cattle / pony grazing and where required site-specific management activities. This will help to maintain the characteristics of the open landscape of coastal and floodplain grazing marsh.

Figure 1 (full size Appendix B) provides the proposed location of scrub planting. However, this may be subject to change following the development of the detailed landscape design. This plan will be updated to reflect any such changes.

7.9 Scrub Planting Preliminary Species Composition

Shrub species that are native to the area and are present locally should be included in the final design. These will include but may not be limited to:

- i. *Sambucus nigra* (Elder);

- ii. *Prunus spinosa* (Blackthorn); and
- iii. *Crataegus monogyna* (Hawthorn).

The following species shall be excluded from any design palette due to their potential to contribute to carr invasion:

- i. *Viburnum opulus* (Guelder rose);
- ii. *Rubus fruticosus* (Bramble);
- iii. *Rhamnus cathartica* (Buckthorn); and
- iv. *Rosa canina* (dog rose).

7.10 Scrub Planting Preliminary Planting Specification

To comply with best practice and recommended scrub planting specifications the following key working methods will be implemented. The final landscape design will provide a comprehensive planting specification which will be adhered to.

- i. Seeding will occur in either autumn and spring and in dry conditions. Periods of frost, drought or other inclement weather will be avoided as far as practicable;
- ii. All planting stations will be weed free and appropriately cultivated prior to planting;
- iii. Plants will be handled, stored and planted in accordance with the requirements of BS8545, The HTA National Plant Specification and the MCHW Series 3000;
- iv. A suitable plant guard will be installed with each planted item. The type of plant guard will be suitable for the plant species and growth habit; and
- v. Mulch will be applied at the base of each planted item to create a 500mm radius weed free area.

7.11 Scrub Planting Preliminary Management and Monitoring

The final landscape design will detail a comprehensive maintenance programme for the establishment period (years 1 – 5 following planting). The activities detailed below are indicative of typical scrub planting schemes and will be subject to change following completion of the detailed landscape design:

- i. Maintain a 1 metre radius weed-free circle around scrub planting through mechanical control. Up to 2 no. visits per year;
- ii. Water new plants as required to minimise failures in periods of drought;
- iii. Remove litter, rubbish, and debris from around the plants throughout the year;
- iv. Re-firm soil around roots to ensure plants are supported and remain upright in Spring;
- v. Inspect and adjust guards, ties and stakes in Spring and Autumn and after strong wind events;
- vi. Inspect and top-up mulch as required;

- vii. Undertake any formative pruning if required;
- viii. Check and record failed or defective plants in September annually;
- ix. Replace failed or defective plants with matching species of the same size during the next planting season after failure;
- x. Undertake annual check of plants to record their growth and condition;

Long term (greater than 5 years post planting) maintenance programmes are recommended to ensure that created habitats continue to achieve their target habitat distinctiveness and habitat condition. Long term maintenance and monitoring specification will be confirmed in the second submission of the LEMP.

FBJV and National Grid will ensure that all detailed design information will be provided to discharge planning conditions prior to the first use of the project.

7.12 Coastal and floodplain grazing marsh

The defining features of coastal and floodplain grazing marsh are hydrological and topographical rather than botanical. Grazing marsh is periodically inundated pasture or meadow containing ditches that provide water regulation to the wider area. These ditches contain standing brackish water and are especially rich in plants and invertebrates.

Coastal and floodplain grazing marsh has a varied vegetational structure and contains a rich mosaic of habitats ranging from bare ground, rough grassland, patchy scrub, damp hollows and temporary pools which are of considerable importance and should be retained.

Coastal floodplain grazing marsh is one of the key / niche habitats that is typical of the Thames Estuary North Important Invertebrate Area².

Areas of coastal and floodplain grazing marsh will be impacted temporarily during the construction of the Proposed Development. Following the completion of construction all areas of temporary habitat loss will be reinstated.

At the Gravesend site the detailed landscape design will facilitate the creation of a rough tussocky ungrazed meadow in the northern field and grazed pasture in the southern two fields.

7.13 Coastal and Floodplain Grazing Marsh Preliminary Species Composition

Indicative species composition for the coastal and floodplain grazing marsh will include grasses that are native and locally occurring and may include:

- i. *Alopecurus pratensis* (meadow foxtail)
- ii. *Cynosurus cristatus* (crested dog's tail)
- iii. *Lolium perenne* (rye grass)
- iv. *Holcus lanatus* (Yorkshire fog)
- v. *Festuca rubra* (red fescue)

² [Thames Estuary North IIA, BugLife 2025](#)

- vi. *Agrostis stolonifera* (creeping bent).

7.14 Coastal and Floodplain Grazing Marsh Preliminary Management and Monitoring

The final landscape design will detail a comprehensive maintenance programme for the establishment period (years 1 – 5 following grazing marsh creation / restoration works).

The detailed management and monitoring regime for habitat creation works will be presented in the second submission of the LEMP for approval by the LPA prior to the operation of the project.

The aim of the establishment maintenance works will be to achieve a botanically and structurally diverse sward.

8 Site lighting

8.1 Overview

FBJV will implement the necessary temporary lighting controls for security and safety reason. In particular, there will be no light spill from permanent external artificial lighting into the watercourse or adjacent river corridor habitat. To achieve this, lighting levels within 8.5 metres of the top of bank of the watercourse will be maintained at background level (0-2lux) as per Condition 11 Gravesham Borough Council Decision Notice 20231313.

There are no lux level thresholds available for individual species so species-specific advice cannot be provided for this site. Every site is different and species responses at lit sites vary.

Lighting has been designed with reference to the Institute of Lighting Professionals Guidance Notes (in particular GN-8³: Bats and Artificial Lighting which was produced in collaboration with the Bat Conservation Trust, and GN-1⁴: Reduction of Obtrusive Light) in so far as it is reasonably practicable.

Full details of lighting design and measures are included in Section 7.6 of CEMP and a Lighting Design Report will be summarised in submission to discharge Condition 11.

8.2 Consideration of Impact to Sensitive Ecological Receptors During Construction

Artificial lighting at night is particularly harmful to bats and other species of wildlife when it is directed towards river corridors, near woodland edges, hedgerows or other sensitive receptors. Appropriately sized 'dark corridors' will maintain an appropriate buffer to prevent light spill from impacting in the watercourses.

8.3 Operational Phase Lighting

Lighting during operation will be avoided wherever possible. If required, it will be designed to ensure that spillage into adjacent habitats is minimised. Lighting design will be undertaken in accordance with the Bat Conservation Trust and Institute of Lighting Engineer's Guidance Note 08/23.

³ [Guidance Note 8 Bats and Artificial Lighting, Institution of Lighting Professionals 2023](#)

⁴ <https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021/>

9 Site Fencing

9.1 Construction Site Perimeter Fencing

Closed board fencing of approx. 2.4 metre height will be used to enclose the construction site.

Given the surrounding terrain is generally at a similar elevation to the working area, this hoarding, by blocking 'line of sight' will reduce noise emitted from the site by approximately 10dB meaning that averaged noise originating from the site experienced across the foreshore and other areas more than 100-150m from the site boundary will be around ambient noise levels. Accordingly, it is considered unlikely that birds using the intertidal zone, together with those located within the Thames Estuary and Marshes SPA and Ramsar sites will be disturbed by noise associated with construction of the tunnel at Gravesend. This remains consistent with the project ES.

9.2 Fencing of Waterbodies and Ditches

A 5m width buffer of semi-natural habitat will be retained adjoining all ditches during construction. No works will be permitted within this buffer zone.

The outer edge of the 5m buffer will be demarcated with a post and fence (or similar) installed under the watching brief of the ECoW. The fence shall be installed working from the interior side of the field to minimise disturbance of the 5m margin which is to be retained. Prior to installation the ECoW shall check the alignment of the fence and undertake a hand search of any features potentially suitable for reptiles that may be disturbed.

Where fencing is installed within the 5m waterbody buffer or to cross waterbodies it will be installed under ECoW supervision and in accordance with statutory legislation for protected species and habitats. Fencing should not hinder the movement of wildlife unless agreed with the ECoW and statutory regulators where applicable.

10 Ditches and Water Bodies

Figure 2 (full size is included in [Appendix B](#)) provides the location of the water bodies (excluding the River Thames estuary and the Thames and Medway Canal) that are near to the Project.

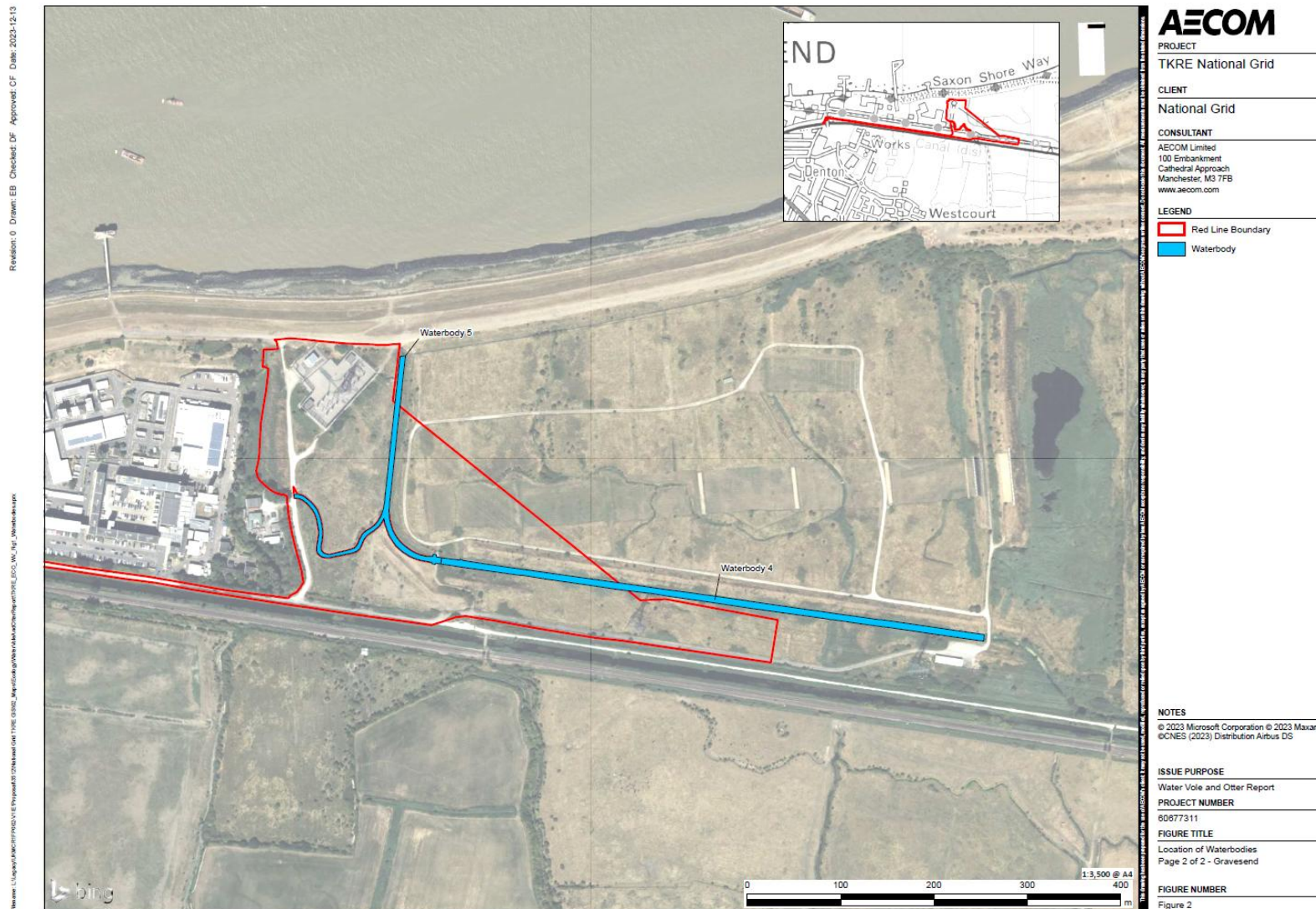


Figure 2 Location of waterbodies in Gravesend (Source National Grid Cable Tunnel Replacement Project Environmental Statement - Volume VI Appendix 7.5: Otter & Water Vole Survey Report (Revision 1)).

10.1 Water Vole Presence

Surveys undertaken in 2023 recorded evidence of water vole activity. Additional survey conducted in 2025 confirms the presence of water voles.

Water voles are known to utilise the ditches within and adjacent to the Gravesend Site.

Any works that are required to be undertaken within 5m of the outer bank edge of a waterbody will occur under the watching brief of an ECoW.

At present the only works expected to require supervision by a protected species licence holder are those required to install outfalls to the adjacent tidal ditches, the installation of temporary bridges and head wall construction. The works areas will be reviewed by a holder of Natural England's class licence allowing water vole displacement (CL31).

Where possible a location with no water vole activity will be utilised. However, if this is not possible then the licence holder will advise on and supervise works to reduce habitat suitability in the agreed location of works and encourage displacement of water vole from the small section of bank needed to undertake the proposed works.

The key constraints of on the use of CL31 (extract from CL31 Guidance) are:

- i. *Cutting of vegetation in accordance with Conditions 8 and 12 must be limited to a continuous length of single bank not exceeding 50 metres or concurrently on both banks of the same watercourse, not exceeding 50 metres in length on each bank, where this is required for the work, or to increase the likelihood of water voles being displaced (see Information and Advice note a and d). There must be a gap of at least 500 metres in length between cuts on the same bank;*
- ii. *Compensation measures are expected to result in no net loss in the amount of habitat available to the water vole population. If your work will result in a net loss of available water vole habitat, you must deliver no overall net loss. To do this, you could improve the connections between water vole colonies or improve habitat quality. For temporary works, an acceptable and proportionate way to demonstrate no net loss would be to restore the affected section to improve habitat quality. and 3) No subsequent attempt at displacement of water voles may be undertaken within the unaffected adjacent habitat for a period of 12 months*

10.2 Head Wall Construction

Where necessary, habitat manipulation will be undertaken in advance of the works to displace water vole from a 5m section of bank to allow a new headwall to be installed. It is preferred that a suitable section of ditch not supporting burrows is used for this feature. However, if that is not possible then habitat manipulation in accordance with class licence CL31 will be used to prepare the construction site.

The timing for habitat manipulation works is during the spring period from 15th February to the 15 April or during the autumn period from 15 September to the 31 October. Works must not occur under the following conditions:

- i. Ambient temperatures are below 5°C;
- ii. Snow is on the ground; and

- iii. During heavy frost.

When habitat manipulation has been completed, the area that has been subject to displacement activity must be managed to maintain the work area in a condition that discourages water voles returning especially when habitat manipulation is completed in the Spring. Such works should adhere to a Precautionary Method of Works.

10.3 Temporary Access Outfall and Bridge Installation

As the areas of habitat to be impacted are small (5-10m stretch) suitable sections of ditch not supporting burrows will be identified by a water vole holder of a CL31 licence to displace water vole. Where necessary habitat manipulation will be undertaken under licence in advance of the works to displace water vole from a 5-10m section of bank to allow the works to be undertaken without disturbing active burrows.

10.4 Ditch and Water Course Mitigation During Construction Phase

During the construction phase all ditches / water courses will be protected from impacts. This will include, but not be limited to:

- i. No plant will be sited within 10m of any waterbody / ditch unless agreed with the ECoW, water vole CL31 class licence holder or in accordance with an agreed Precautionary Method of Works;
- ii. No refuelling will occur within 10m of any waterbody / ditch;
- iii. A 5m width buffer of semi-natural habitat will be retained adjoining all ditches during construction. No works will be permitted within this buffer zone;
- iv. The outer edge of the 5m buffer will be demarcated under the watching brief of the ECoW. The fence will be installed working from the interior side of the field to minimise disturbance of the 5m margin which is to be retained. Prior to installation the ECoW shall check the alignment of the fence and undertake a hand search of any features potentially suitable for reptiles that may be disturbed;
- v. No site clearance will occur within this 5m buffer area without prior agreement with the ECoW
- vi. Site lighting will be directed so that light spill does not enter the waterbody 5m buffer
- vii. The pollution prevention measures detailed within the Construction Environmental Management Plan (CEMP) will be adhered to. These will be in accordance with
 - a. CIRIA C532 - Control of water pollution from construction sites. Guidance for consultants and contractors
 - b. CIRIA C648 – Control of Water Pollution for linear construction projects Technical Guidance
 - c. CIRIA C649 – Control of Water Pollution for linear construction projects site guide
 - d. Adhere to the conditions stipulated in all site-specific Environmental Permits and / or Flood Risk Activity Permits

10.5 Management Of Water Courses / Ditches Post Construction

Coastal and floodplain grazing marsh within the Proposed Development includes ditches / water courses. For the hydrological functionality of the grazing marsh to be effective these features and any created land scrapes will require periodic maintenance.

Long term (greater than 5 years post habitat creation) maintenance programmes are recommended to ensure that created habitats continue to achieve their target habitat distinctiveness and habitat condition. Long term maintenance and monitoring will be detailed in the final landscape design for the development. These will be included in the second revision of this LEMP submitted for planning approval to discharge planning conditions prior to the first use of the project.

11 Pollution prevention measures

The Construction Environmental Management Plan (CEMP) contains the detailed measures for preventing pollution of sensitive areas. These are employed as standard best practice to ensure that any potential environmental impacts will be avoided.

Pollution control measures will comply with the following guidance documents as Good Industry Practice:

- i. CIRIA C532 - Control of water pollution from construction sites. Guidance for consultants and contractors.
- ii. CIRIA C648 – Control of Water Pollution for linear construction projects. Technical Guidance dated 2006.
- iii. CIRIA C649 – Control of Water Pollution for linear construction projects site guide.

Appendix A – Ecological Calendar

Ecology		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Habitats & Flora	Surveys	Tree Surveys		Phase 1 Preliminary Ecological Appraisal/NVC & Tree Surveys							NVC & Tree Surveys	Tree Surveys	
Bats	Surveys	Hibernation Surveys		Sub Optimal hibernation Surveys	Sub optimal activity survey	Activity Survey					Sub Optimal hibernation Surveys	Sub optimal activity survey	Hibernation Survey
Badger	Surveys	Activity /sett surveys			Sub optimal surveys in dense vegetation						Activity /sett surveys		
Water Vole	Surveys	Habitat assessment only			Sub optimal survey period	Survey season					Sub optimal survey period	Habitat assessment only	
GCN	Surveys	All year habitat surveys		presence/absence surveys	Presence/Absence survey, population estimate and eDNA		eDNA	All year habitat surveys					
Reptiles	Surveys	Habitat assessment only			Activity Surveys			Reduced activity survey during warmer temperatures - suboptimal surveys		Activity Surveys	Habitat assessment only		
Birds	Surveys	Wintering birds surveys		Breeding and migration bird surveys		Breeding bird surveys				Migration bird surveys		Wintering bird surveys	

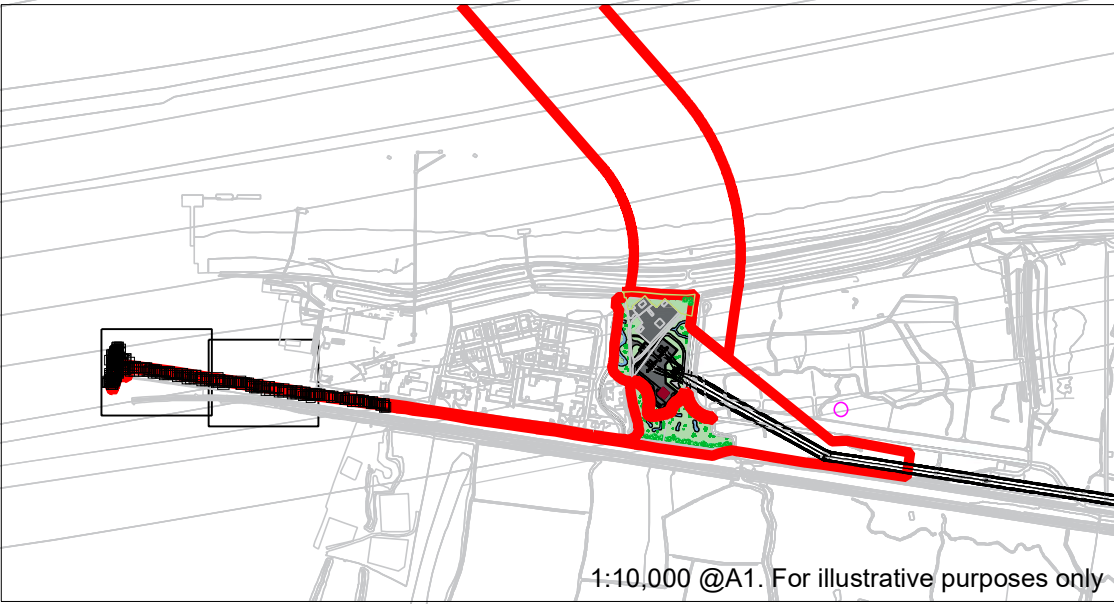
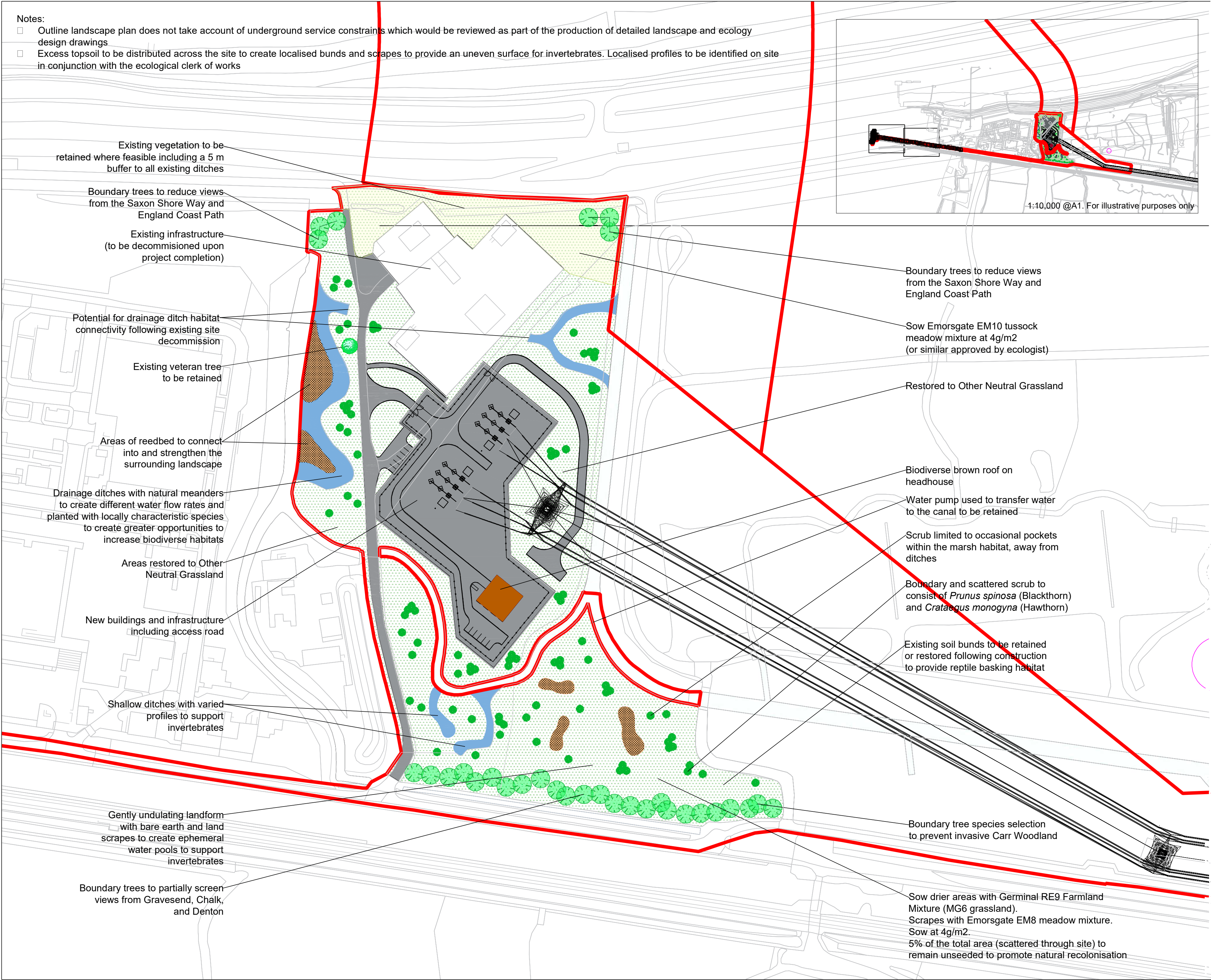
Appendix B – Drawings

Figure 1 Outline landscape and ecology plan - Gravesend (Source AECOM OLEMP submitted for planning permission).

Figure 2 Location of waterbodies in Gravesend (Source National Grid Cable Tunnel Replacement Project Environmental Statement - Volume VI Appendix 7.5: Otter & Water Vole Survey Report (Revision 1)).

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Project Management Initials: MARSHALLB
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Last Plotted: 2023-12-06

- Notes:
- Outline landscape plan does not take account of underground service constraints which would be reviewed as part of the production of detailed landscape and ecology design drawings
 - Excess topsoil to be distributed across the site to create localised bunds and scrapes to provide an uneven surface for invertebrates. Localised profiles to be identified on site in conjunction with the ecological clerk of works



PROJECT

TKRE Cable Tunnel Replacement Project - National Grid

CLIENT

National Grid Electricity Transmission
1-3 Strand, London WC2N 5EH
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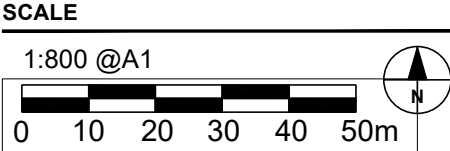
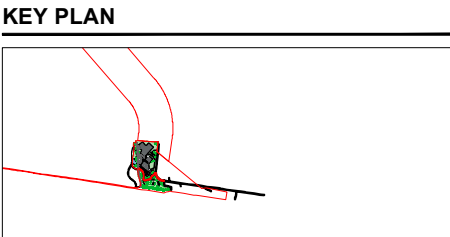
CONSULTANT

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- LEGEND
- Red Line Boundary (RLB)
 - Proposed tree
 - Proposed scrub vegetation
 - Existing veteran tree
 - Existing drainage ditches (partially culverted)
 - Proposed field drain / ephemeral water scrape
 - Proposed Other Neutral Grassland
 - Retained vegetation where feasible
 - Biodiverse brown roof on headhouse
 - Proposed reedbeds
 - Proposed building and infrastructure areas

ISSUE/REVISION

I/R	DATE	DESCRIPTION
2	06Dec2023	Updated following client review
1	08Nov2023	Initial drawing



PROJECT NUMBER

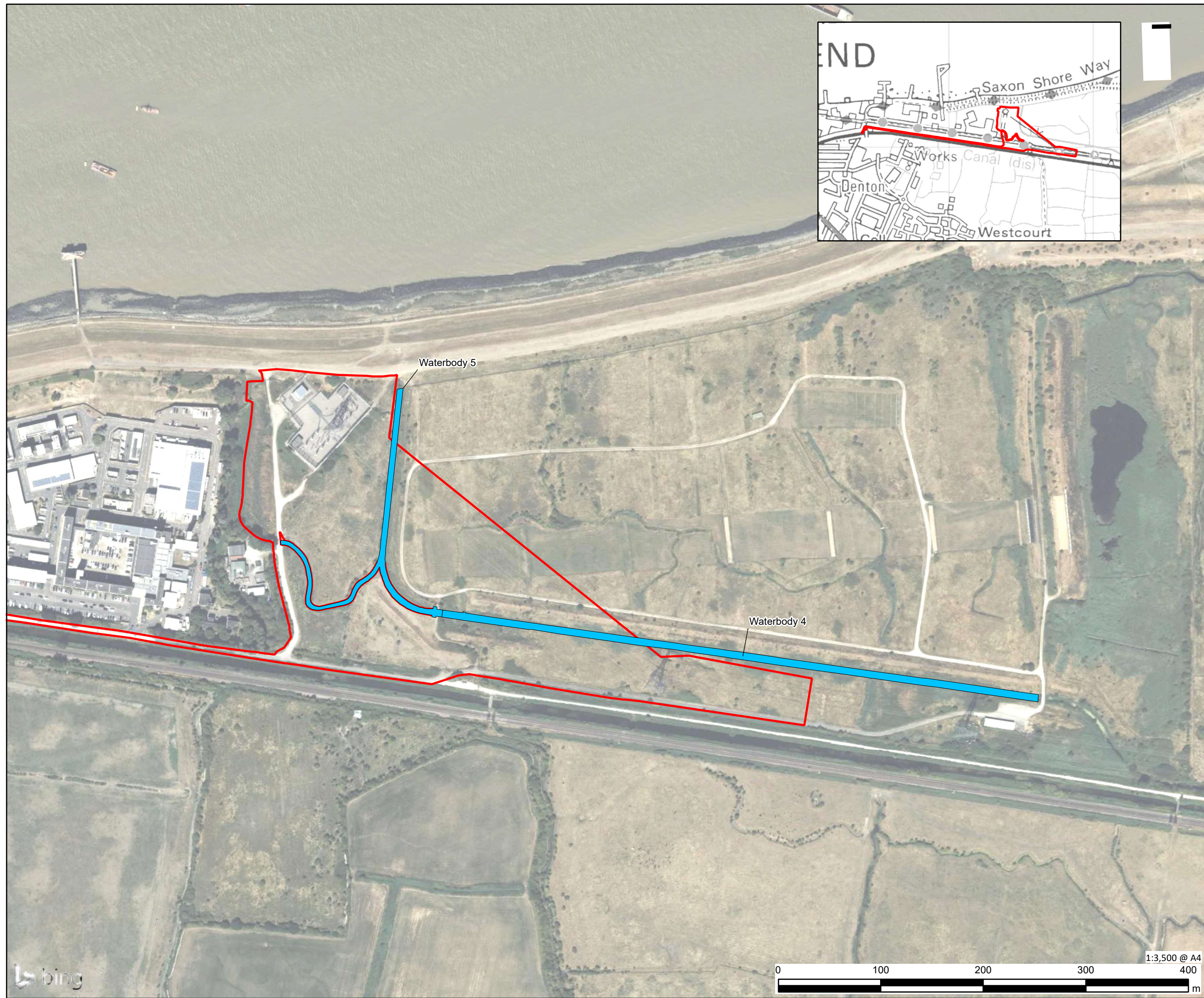
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SHEET TITLE

Outline Landscape and Ecology Plan
Gravesend

SHEET NUMBER

60677311-ACM-00-XX-DR-LA-000002



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LEGEND

 Red Line Boundary

 Waterbody

FIGURE NUMBER
Figure 2

Appendix C - Construction Ecological Management Strategy and Ecological Design Strategy



Grain to Tilbury

Document Title
LEMP Appendix C Gravesham Borough Council Construction Ecological Management Strategy and Ecological Design Strategy

FBJV Document Number:	GRR-FBJ-PM-GRRS4-ZA-ZE-000001
NG Document Number	n/a

Purpose of Issue	For Approval	Document Suitability	S5 - For Review & Acceptance	Date	11/07/2025
				Revision	P04
Asite Task ID	N/A				

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Prepared by:	Reviewed by:	Approved by:
Position Environmental Manager (FER)	Position JV Environmental and Sustainability Manager	Position JV Consent Manager
Name Mat Sapsford	Name Ruth Garcia de la Calle	Name Nick Warans
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Revision History			
Rev No	Date	Summary of Changes	Section or Page Number
P01	08/04/2025	First issue	
P02	13/05/2025	Internal review	All
P03	17/06/2025	National Grid comments addressed	Several
P04	11/07/2025	National Grid comments addressed	Several

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1 Overview

1.1 Introduction

This document is presented as Appendix C to the Landscape and Ecological Management Plan (LEMP) for approval of Gravesham Borough. The Grain to Tilbury tunnel replacement project (the Project) involves the replacement of the existing 1960s Thames Cable Tunnel beneath the Thames between Tilbury and Gravesend.

National Grid (NG) has appointed FBJV as the Design and Construction (D&C) Contractor responsible for undertaking the detailed design and construction of the Project all in accordance with the constraints and parameters of the Planning Permission and NG specifications. FBJV is a joint venture formed between Ferrovial Construction (UK) Ltd and BEMO Tunnelling GmbH.

1.2 Discharge of Planning Conditions

The purpose of this document is to provide the information specified by Gravesham Borough Council in Decision Notice ref 20231313 in order to discharge the planning conditions related to biodiversity, ecological and landscape / habitat creation works associated with the project (Condition 10 and 12).

1.2.1 LEMP submission 1

Submission 1 will incorporate the construction phase information specified within the Construction Ecological Management Strategy (Biodiversity Method Statement), the LEMP (Condition 11) and the Ecological Design Strategy (Conditions 10, 12).

Submission 1 of the LEMP will occur prior to the commencement of works within the Gravesend Site.

1.2.2 LEMP submission 2

Submission 2 of the LEMP will incorporate the operational phase information specified within the Construction Ecological Management Strategy (Biodiversity Method Statement), the LEMP, the Ecological Design Strategy and the Offsite Biodiversity Measures (Conditions 10, 11, 12, 16).

Submission 2 of the LEMP will occur prior to the start of above ground construction of the headhouse.

FBJV and National Grid will ensure that all detailed design information will be provided to discharge planning conditions prior to the first use of the project.

2 Schedule of Relevant Planning Conditions

Table 1 identifies the constituent parts of planning conditions 10 and 12, and where the associated information can be found within this document.

Table 1 Plan section where relevant information to discharge planning conditions 10 and 12 can be found.

Plan	Condition	Detail	Plan Section	First Issue	Second Issue
CEMS - biodiversity	10 a	Risk assessment of potentially damaging construction activities	4.1	Yes – full details	-
CEMS - biodiversity	10 b	The identification of biodiversity protection zones and the use of protective fences, exclusion barriers and warning signs. This shall include a suitable buffer zone(s) (as set out by a suitably qualified ecologist) for relevant protected and priority species;	5	Yes – full details	-
CEMS - biodiversity	10 c	Extent and location of proposed works shown on appropriate scale maps and plans for all relevant species and habitats;	6	Yes – full details	-
CEMS - biodiversity	10 d	Practical measures (both physical measures and sensitive working practises) to avoid or reduce impacts during construction (may be provided as a set of species or habitat-specific method statements);	7	Yes – full details	-
CEMS - biodiversity	10 e	The location and timing of sensitive works to avoid harm to biodiversity features;	7	Yes – full details	-
CEMS - biodiversity	10 f	Timetable for implementation, demonstrating that works are aligned with the proposed phasing of construction;	8	Yes – full details	-
CEMS - biodiversity	10 g	The times during construction when specialist ecologists need to be present on site to oversee works;	7.3	Yes – full details	-
CEMS - biodiversity	10 h	Details of any necessary protected species licences or reference to other relevant documents as required (e.g., Arboricultural Method Statement/ updated species survey reports/ecological design strategy);	5	Yes – full details	-
CEMS - biodiversity	10 i	Responsible persons and lines of communication;	9	Yes – full details	-
CEMS - biodiversity	10 j	The role and responsibilities on site of an ecological clerk of works (ECoW) or similarly competent person.	9.4	Yes – full details	-
Ecology Design Strategy	12 a	Up-to-date survey data carried out in accordance with best practice for the both the development site and the proposed off-site compensation site(s);	11 , Appendix A	Yes – full details	-
Ecology Design Strategy	12 b	Purpose and conservation objectives for the proposed works;	12	-	Yes – full details
Ecology Design Strategy	12 c	Review of site potential and constraints;	13	Yes – full details	-
Ecology Design Strategy	12 d	Description and evaluation of features to be managed	4 & 5	Yes – full details	-

Plan	Condition	Detail	Plan Section	First Issue	Second Issue
Ecology Design Strategy	12 e	Detailed design(s) and/or working method(s) to achieve stated objectives. This shall include a detailed methodology for the movement of reptiles and measures to prevent reptiles returning to the site prior to and during the development. This shall also include details of how any receptor sites will be enhanced and be in a suitable condition to support the likely number of animals which will be moved, prior to any animals being moved, and details of the management of the compensation site(s) in perpetuity.	14	Yes – partially	Yes – Full details
Ecology Design Strategy	12 f	Full details of soft landscape works, to include species, size and location of new habitats (e.g., trees, shrubs, hedges and grassed areas to be planted) with the extent and location/area of proposed works shown on appropriate scaled maps and plans;	15	-	Yes – full details
Ecology Design Strategy	12 g	Full details of the proposed ecological features. For habitat boxes details shall include numbers, make and model, locations to include height, aspect and mounting location shown on scaled landscaping plans suitable for construction. For log piles and hibernacula details shall include materials, size, shape and construction methodology. Locations shall be shown on scaled landscaping plans suitable for construction;	16	-	Yes – full details
Ecology Design Strategy	12 h	Extent and location/area of proposed works on appropriate scale maps and plans	6	Yes – full details	-
Ecology Design Strategy	12 i	Full details of the extent of appropriate buffers (as set out by a suitably qualified ecologist) for protected and priority species;	5	Yes – full details	-
Ecology Design Strategy	12 j	Type and source of building materials to be used where appropriate, e.g. native species of local provenance;	15 & 16		
Ecology Design Strategy	12 k	Timetable for implementation demonstrating that works are aligned with the proposed phasing of development;	8	Yes – full details	-
Ecology Design Strategy	12 l	Details of the body or organisation(s) responsible for implementing the EDS and the mechanisms for securing the mitigation/compensation land and its management for the lifetime of the development;	17	Yes – partially	Yes – full details
Ecology Design Strategy	12 m	Details of initial aftercare and appropriate management prescriptions for relevant protected and priority species and habitats (as identified by a suitably qualified ecologist and in accordance with information submitted as part of the application) for the lifetime of the development within a Landscape and Ecological Management Plan;	16	-	Yes – full details
Ecology Design Strategy	12 n	Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five-year period);	16	-	Yes – full details

Plan	Condition	Detail	Plan Section	First Issue	Second Issue
Ecology Design Strategy	12 o	Details for monitoring (to be undertaken by a suitably qualified ecologist(s)) and remedial measures.	18		

3 Construction Ecological Management Strategy

3.1 Scope

This Section provides the information to satisfy Planning Condition 10 and 12 of Decision Notice 20231313 relevant to the construction phase only.

Information and designs associated with detailed landscape and ecological designs will be provided in the next iteration of this document, which will be submitted for approval from the Local Planning Authority prior to construction completing.

4 Construction Activities Environmental Risk Assessment

4.1 Risk Assessment Project Details and Summary Matrix

The risk assessment below identifies key construction activities and the risks they pose to sensitive environmental features and / or ecological receptors.

The anticipated phases of the site set up will be:

- i. Demarcation of ecological / environmental construction exclusion zones or buffers;
- ii. Site clearance;
- iii. Installation of site perimeter fencing;
- iv. Construction compound set up; and
- v. Commencement of construction works.

WORK LOCATION:				Risks resulting from adverse effects						
FBJV Gravesend Construction Site				Risk Quantification (Likelihood X Severity)	Minor injury, insignificant damage or environmental impact Non-Reportable Minor injury, or damage Reportable injury, moderate loss of process, Reportable Major injury, or damage or environmental Fatality, building loss, catastrophic environmental					
ELEMENT OF WORK										
Site set up										
Risk Assessment Assessor/Author:	Name	Signature	Date	LIKELIHOOD		SEVERITY				
	Matt Sapsford		02/04/2025	Near Certain	5	L(5)	M(10)	H(15)	H(20)	H(25)
				Probable	4	L(4)	M(8)	H(12)	H(16)	H(20)
				Possible	3	L(3)	M(6)	M(9)	H(12)	H(15)
				Unlikely	2	L(2)	L(4)	M(6)	M(8)	M(10)
				Remote	1	L(1)	L(2)	L(3)	L(4)	L(5)
				Low Risk (1-5)		Moderate Risk (6-10)		High Risk (11-25)		
				ACCEPTABLE		ALARP		UNACCEPTABLE		
Approval:	Name	Signature	Date	Notes: 1. Low Risk = Risk is ACCEPTABLE . No further preventative action required, consider cost effective solutions or improvements that impose no additional cost. 2. Moderate Risk = Work may only start if the risk has been reduced to As Low as Reasonably Practicable (ALARP). Consider additional control measures that reduce the risk without significantly increasing cost. 3. High Risk = Risk is UNACCEPTABLE . Do not start work or continue until risk level is reduced using additional and suitable control measures to a reasonably practicable level. 4. Control measures are to ensure that residual risks are reduced to as low as reasonably practicable. Where controls fail to reduce to an ACCEPTABLE or ALARP level the assessment must be referred to your Line Manager. Remember: whilst it is possible to reduce the <u>residual likelihood</u> through the identified controls, the same controls will often not reduce the <u>residual severity</u> risk rating e.g. the residual severity of a fall from height remains the same unless the additional controls substantially reduce the potential fall from height distance or additional controls such as safety nets, for example, are incorporated.						
	Ruth Garcia		13/05/2025							

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Site clearance – establishing ecological / environmental exclusion zones Tree protection measures to prevent root and branch damage	Veteran tree ref. T139	3	4	12 (H)	- Arboricultural specialist sets out calculated root protection area (RPA). Due to the high roost suitability, 7.5 - 10m radius Construction Exclusion Zone (CEZ) will be implemented. - Vegetation within the calculated root protection area (RPA) will be retained and protected as much as feasible. - Roost features will be checked to determine the presence/absence of roosting bats. - Site operatives securely install heras panel fencing (or similar) at outer edge of RPA to exclude construction access. - Suitability of fencing signed off by Arboricultural specialist. - Arboricultural specialist to affix signage on fence detailing construction exclusion zone, no access and environmental team contact details. - Location of tree protection measures included in daily activity briefing.	3	1	3 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Site clearance – establishing ecological / environmental exclusion zones Construction activities encroach on waterbody Breach of statutory legislation protecting wildlife and habitats	Waterbody, water vole habitat, reptiles	4	4	16 (H)	- Establish and maintain a 5m width buffer of retained / undisturbed vegetation adjacent to waterbodies. - Exclude construction works from occurring within 5m buffer unless agreed with ECoW and adhering to a PMoW. - Boundary of buffer to be marked with suitable fencing to prevent incursions into this area. - Prior to fence installation the ECoW shall check the alignment of the fence and undertake a hand search of any features potentially suitable for reptiles that may be disturbed. - Fence to be installed working from the interior side of the field to minimise disturbance of the 5m buffer. - Site lighting to be positioned and directed to avoid light spill impacting retained habitat and maintain a dark corridor.	4	1	3 (L)
Site clearance – establishing ecological / environmental exclusion zones Disturbance of roosting bats by construction activities. Breach of statutory legislation protecting wildlife and habitats	Bat roost potential features in veteran tree ref. T139	4	2	8 (M)	- ECoW to inspect tree to determine absence / presence of roosting bat in potential roost features. - Bat presence confirmed: - ECoW establishes appropriate buffer to exclude construction works and prevent disturbance of bat. - ECoW installs temporary exclusion device under licence. - Features resurveyed to confirm bat absence. - If bat absent roost feature to be sterilised to prevent bat roosting during construction phase. - Bat absence confirmed - ECoW to supervise immediate removal of sufficient vegetation around tree to disconnect it from surrounding environment and reduce opportunity for foraging bats to access roost feature.	4	1	4 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Site clearance – establishing ecological / environmental exclusion zones Breach of statutory legislation protecting wildlife and habitats	Nesting birds	3	4	12 (M)	- Pre-mobilisation Walk over by ECoW no sooner than 48 hours prior to works commencing. - Isolation of identified active bird nests and installation of construction exclusion zone suitable to species and construction activity. - ECoW to brief subcontractor at daily briefing of location and status of identified active bird nests. - Access routes and work positions to be outside of any identified exclusion zones. - ECoW to monitor nest status during works to ensure exclusion zones are adhered to and works are not impacting nesting activity - Where required exclusion zones to be assessed if there is a change in working method. - Vegetation clearance works to be carried out under a Permit to Clear procedure and supervised by ECoW.	3	1	3 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Site clearance – de vegetation works Breach of statutory legislation protecting wildlife and habitats	Reptiles	3	3	9 (M)	- Identify areas of site clearance that contain suitable reptile habitat - Implement a Precautionary Method of Working (PMoW) to minimise impacts to reptiles - Programme works to occur during the reptile active season between March and October. - Where reptile hibernacula are to be destroyed / removed this should occur between March and September under suitable weather conditions. - Undertake complete vegetation clearance in a two-stage cut and a destructive search by ECoW in line with PMoW: - Any encountered reptiles to be collected and transported to retained areas of habitat in accordance with PMoW and best practice. - Destructive search: ECoW removes any remaining reptiles and dismantles any refugia. - All vegetation cut down to 150mm. - After 24 hours complete site clearance to ground level can occur under ECoW supervision. - Where reptile habitat is to be retained on site best practice will be in place and under the supervision of ECoW to separate it from the works. - If a significant number of reptiles are encountered, works should cease and approach to site clearance be amended. Mitigation Strategy to follow. See Section 14 for full details	3	1	3 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Site clearance – de vegetation works Breach of statutory legislation protecting wildlife and habitats	Badgers	3	3	9 (M)	<i>In the event that badger sett is identified on site during the site clearance:</i> - Implement a 30m construction exclusion zone / buffer around active sett entrances. - Where works are required within the 30m the requirement for a Natural England licence should be considered. - Ensure all chemicals are stored in appropriate COSHH containers when not being used. - Maintain vegetation surrounding active badger setts to maintain connectivity with surrounding habitat.	3	1	3 (L)
Site clearance – de vegetation works Noise and vibration	Sensitive ecological features	3	2	6 (M)	- ECoW walkover to identify sensitive ecological features prior to works. - ECoW to install construction exclusion zones if required. - Site clearance to occur during daylight hours, outside of dawn and dusk. - Maintain plant and machinery in optimum condition to ensure efficient operation. - Implement a no idling policy for machinery and plant so that it is switched off when not in use.	3	1	3 (L)
Site clearance – temporary compound / welfare Breach of statutory legislation protecting wildlife and habitats	Sensitive ecological features	3	2	6 (M)	- Site welfare to be placed outside of any construction exclusion zones around sensitive ecological features. - Site lighting to be positioned and directed to avoid light spill impacting retained habitat and ecological construction exclusion zones. - Security lighting to be motion sensitive rather than continuous flood lit.	3	1	3 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Construction activities Spread of non-native invasive species and plant and animal diseases	Invasive non-native species	3	2	6 (M)	- Adhere to the requirements of Defra's "Check, Clean, Dry" principles and ensure that all PPE and plant and equipment is clean and dry (and if necessary, disinfected) prior to going to and from the construction area. - Pre-mobilisation ecological walkover of works area to determine the presence / absence of INNS. - Isolation of any discovered INNS through the implementation of an appropriate exclusion zone to ensure that these species are not disturbed by works. - Where required removal of INNS will be carried out by a specialist contractor. - Japanese knotweed (<i>Reynoutria japonica</i>) identified in ditch vegetation adjacent to Wharf Road site access road: - All construction vehicles to remain within hard surface of highway. - Implement a construction exclusion zone to prevent vehicle and pedestrian access to affected area. - Identify exclusion zone in site induction.	3	1	3 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Construction activities Installation of temporary bridge across waterbodies Breach of statutory legislation protecting wildlife and habitats	Water vole habitat	4	3	12 (H)	- Establish appropriate flood risk activity permit from Environment Agency. - Pre-mobilisation water vole survey of area impacted by installation and appropriate buffer zone as defined by the ECoW. - Where practicable install bridge outside of the area of impact from any identified water vole burrows. - If water vole burrows are identified at installation site carry out displacement and destructive search under appropriate licence - Installation of temporary bridge under ecological supervision and in accordance with a PMoW. - Temporary bridge abutments to span the water course and maintain a buffer between bank edge and abutment. - Temporary bridge spans water course and bank edges, negating the requirement for riparian and in channel vegetation management works. - Temporary bridge spans water course and bank edges thus allowing continued connectivity to suitable habitat upstream and downstream of work area.	4	1	4 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Construction activities Installation of site perimeter fencing across waterbodies Breach of statutory legislation protecting wildlife and habitats	Water vole habitat	5	4	20 (H)	- Establish appropriate flood risk activity permit from Environment Agency. - Pre-mobilisation water vole survey of area impacted by installation and appropriate buffer zone as defined by the ECoW. - Where practicable install fencing outside of the area of impact from any identified water vole burrows. - If water vole burrows are identified at installation site carry out displacement and destructive search under appropriate licence - Installation of fencing under ecological supervision and in accordance with a PMoW. - Fencing to be of a type that permits unhindered passage by water voles to prevent habitat fragmentation.	5	2	10 (M)
Construction activities Installation of water outfalls and other structures within waterbodies Breach of statutory legislation protecting wildlife and habitats	Water vole habitat	5	4	20 (H)	- Establish appropriate flood risk activity permit from Environment Agency. - Pre-mobilisation water vole survey of area impacted by installation and appropriate buffer zone as defined by the ECoW. - Where practicable install structure outside of the area of impact from any identified water vole burrows. - If water vole burrows are identified at installation site carry out displacement and destructive search under appropriate licence. - Installation of structure under ecological supervision and in accordance with a PMoW.	5	2	10 (M)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Construction activities Noise and vibration	Sensitive ecological features	3	4	12 (H)	- Installation of close board fencing around perimeter of construction site minimises the risk of disturbance of adjacent habitats and the species they support. - Maintain plant and machinery in optimum condition to ensure safe operation. - Implement a no idling policy for machinery and plant so that it is switched off when not in use. - Where practical source electrically operated plant and machinery as alternative to petrol / diesel powered versions. - Construction site is at sufficient distance from river foreshore to not disturb intertidal birds.	3	1	3 (L)
Site lighting Disturbance	Sensitive ecological features	4	3	12 (H)	- Where required sensitive design will ensure that light spillage into adjacent habitats is minimised. - Security lighting to be motion sensitive. - Site lighting to be positioned and directed to avoid light spill impacting retained habitat and ecological construction exclusion zones. - Task lighting to be directed towards operation and preferably sited between activity and retained habitat / ecological construction exclusion zones to minimise light spill impacts.	4	1	4 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
COSHH Materials Oils, Grease, Fuel	Waterbodies, habitats and species	2	3	M (6)	<i>COSHH materials will be stored securely in even surfaces to avoid any spillage.</i> <i>The relevant datasheets will be available for awareness of the materials stored.</i> <i>No materials, contaminants, chemicals will be stored within 10m of any water course or agricultural drainage feature.</i> <i>Specific designated areas for storage of materials will be agreed and operatives will be briefed about the importance of maintaining the site and storage tidy.</i>	2	1	2 (L)

Construction Activity and Associated Hazard(s)	Environmental Feature at risk	Severity	Likelihood	Risk rating	Control measures to be implemented to mitigate risks	Residual risk		
						Severity	Likelihood	Risk Rating
Protection of the Environment Fluid leak - Oil, Fuel Leak, Hydraulic leak, Refuelling spill, contamination of the surface water features network	Water courses,	3	3	M (9)	- Plant to be issued with fully stocked Spill Kit. - Additional Spill Kits to be fully stocked and kept near the working sites, where work site is within 10m of waterbody edge. - Plant Nappies and Drip Trays to be used when refuelling. - Only designated areas to be used for refuelling and these will be located at least 10m away from the waterbodies. - Operatives to be briefed or Toolbox Talks (TBT) to be delivered with regards to spill kit procedure and correct use of materials and disposal of the materials used. - No storage of materials, contaminants, chemicals, silt in the vicinity (10m) of any waterbodies. - Fuel oils to be stored in clearly labelled jerry cans and kept out of reach of any third parties, and away from the river and flood plain water courses. - Caution should be taken with regard to prevailing winds and overfilling should be avoided through due diligence. - Materials (machinery and plant consumables and installation materials) as well as fuel oils and samples to be stored at the site compound in stillages/on pallets and in secure lockable containers. - Location of site compound will be away from water courses and agricultural drainage features.	3	1	(L) 3

5 Biodiversity Protection Zones

These will be implemented to help ensure that sensitive ecological features (both species and habitat) are protected from construction related impacts.

Where a distance is provided below, this should be interpreted as the radial spread of a Construction Exclusion Zone (CEZ) and be centred on the site of biodiversity significance.

The project ECoW will ensure all CEZs are implemented and appropriately demarcated with barriers suitable for preventing incursion and that appropriate signage.

It should be noted that occasional construction activity may need to occur within identified CEZs. For example, for the temporary access outfall, pedestrian bridge installation and headwall construction (See Chapter 8 of LEMP for full details). Such activity will be appropriately planned, in accordance with a task specific ecological method statement / PMoW, under a licence provided by Natural England, if required, and supervised by an appropriately experienced and trained specialist.

5.1 Badgers

During the 2025 survey, no badger setts were identified within the site, confirming the results of AECOM's 2023 survey. In the event that a badger sett is identified during the construction phase, the sett entrance will be protected by a 30m radius construction exclusion zone. If any works are required within 30m, a Natural England licence will be considered and obtained where necessary.

Where practicable, vegetation within the badger CEZ will be retained to ensure connectivity to adjacent retained habitat. Any exceptions to this practice must first be agreed with the ECoW.

5.2 Bats

The bat surveys carried out to inform the planning application submission for the scheme did not identify any confirmed bat roosts within the site extents.

Should future surveys or ECoW pre-construction walkovers identify the presence of roosting bats then the following CEZs may be implemented:

- Confirmed summer / day roost – 20m
- Confirmed hibernation roost – 30m
- Confirmed maternity roost – 30m

It should be noted that the CEZs identified above are subject to change, as determined by the ECoW, as certain species of bat are more susceptible to disturbance.

5.2.1 Veteran Tree Ref. T139

During the bat surveys T139 a veteran elder tree (*Sambucus nigra*) was identified as possessing features that have high bat roost suitability. This tree is sited within the proposed car parking area of the construction compound.

Due to the high roost suitability, a 10m radius CEZ will be implemented.

Site clearance works will result in this tree becoming an isolated ecological feature within the construction compound. Vegetation within the calculated root protection area (RPA) will be retained and protected in accordance with the planning submission Arboricultural Impact Assessment (AIA).

Prior to the commencement of site clearance, the roost features will be checked to determine the presence / absence of roosting bats. If bat absence is confirmed then site clearance can proceed. If bat presence is confirmed, the ECoW will confirm the appropriate bat CEZ to be implemented and whether a vegetation corridor should be retained to provide connectivity to adjacent bat habitat. Vegetation clearance can proceed outside of this CEZ.

Site clearance will remove adjacent habitat and therefore the tree's connectivity with nearby bat foraging and commuting habitats. Update endoscope inspections will be carried out on T139, if bats are deemed likely absent as a result of these inspections, then the ECoW can reduce the specified bat CEZ to equal that of the RPA for T139.

Should bats return to utilise T139 as a roost during the construction phase the ECoW may deem the RPA to be a sufficient buffer to disturbance - as the roosting bat is considered to be habituated to nearby construction activity.

5.3 Breeding Birds

Prior to the commencement of site works the ECoW will carry out a walkover to assess for the presence of breeding birds.

If breeding birds are identified a CEZ will be implemented. The radius of the CEZ will be dependent on the species of bird and its susceptibility to disturbance.

As a minimum a 5m CEZ will be implemented. However, this can be significantly increased to reflect the conservation status of the species of the bird and susceptibility to disturbance.

Breeding bird CEZs will be demarcated by appropriate barrier fencing and their location identified in the daily briefing.

During construction the ECoW will observe the breeding birds and assess if changes in construction activity may result in greater risk of disturbance and therefore require the CEZ to be increased. As relevant, this will be communicated to the Environmental Manager and the Construction Manager as soon as practicable.

The ECoW will observe breeding bird activity and inform the site supervisor and Environmental Manager when the CEZ can be removed.

5.4 Grassland Habitats

It is anticipated that no grassland habitat will be retained within the site compound. Grassland habitats adjoining the ditches within the stand-off areas will be retained. The use of close board hoarding at the site perimeter will prevent encroachment / impacts associated with construction activities.

5.5 Intertidal and Overwintering Birds

The construction works are located at a sufficient distance (400m) from the foreshore environment to prevent disturbance to intertidal birds. Therefore, no CEZ requires to be implemented for intertidal birds.

Intertidal bird surveys were conducted between October 2022 and March 2023 by AECOM and identified 23 waterbird species using the intertidal survey area at Gravesend. Notable peak counts included black headed gull (142 individuals at high tide) and tern (65 peak count). Based on the range of species and relatively low number recorded, the site is considered to be of up to District importance (ES Volume IV, Chapter 15 Biodiversity – Gravesend (Page 53).

Additional mitigation measures will include 2.4 m solid hoarding installation which would provide a 10dB reduction in noise escaping the construction site where the hoarding breaks line of site between source and receptor.

Overwintering bird surveys were also completed on site by AECOM between October 2022 and March 2023. These included a detailed survey of terrestrial habitats for non-breeding birds based on methods described by Bibby et al and Gilbert et al. A total of 17 species were recorded from these surveys. Protected and notable species included kestrel, rook, and reed bunting which were all on the Birds of Conservation Concern amber list. Reed bunting are also a Species of Principal Importance (SPI). No Annex 1 bird species were recorded at Gravesend. Based on the low numbers of widespread common species, and no birds were recorded at national level (i.e. 1% or more the of UK non-breeding population) no further bird surveys have been recommended at Gravesend, as they are evaluated as being no more than local importance.

5.6 Reptiles

AECOM (2024)¹ have identified that the nature of the habitats suitable for reptiles currently present within the site contain a long grassland sward that is suitable for foraging but with limited basking and refugia habitats. The condition of the habitat is therefore likely to have a limited carrying capacity and indicates that a low population of reptiles is present across the site.

The recent survey carried out in 2025 by Thomson Environmental Consultants confirmed the low population of common lizard and grass snake and a medium population of slow worm are present on site. The site is deemed suitable for habitat manipulation involving a two-stage cut. A destructive search in advance of final site clearance activities being undertaken will ensure effective displacement of reptiles. It is anticipated that activity within the construction compound and a lack of connected habitat and appropriate refugia will negate the need for further mitigation. Given the small and temporary nature of the clearance for construction phase, and the mostly low numbers of reptiles on site, a full translocation exercise is not considered necessary. Compensation and enhancements will be required, including the installation of eight log/ brash pile refugia and adjustments to the mowing regime to the north and east of the site. A full copy of the Reptile Mitigation Strategy detailing these requirements is included in [Appendix B](#).

5.7 Invertebrates

Surveys undertaken in 2023 identified a total of four Species of Principal Importance (SPI) present on site; including the brown-banded carder-bee, shrill carder-bee, hornet robberfly and small heath butterfly. The site is of county importance for invertebrates, in particular the habitats to the West of the site support a diverse structure which supports a wide range of species. Enhancements are proposed within the reptile mitigation strategy which will also benefit the SPI invertebrate species. A construction monitoring programme has been proposed which will include monitoring visits for these species during the construction phase. Longer term enhancements will be detailed in the next issue of the LEMP document.

¹ Response to Ecological Points Raised in KCC Advice to Gravesham BC Dated 27 February 2024, AECOM.

5.8 Retained Trees

Retained trees will be protected in accordance with the guidance provided in the AIA supporting the planning application. This will entail, as a minimum, the installation of tree protection fencing at the outer margins of calculated RPAs.

Where works are required to be carried out within a tree's CEZ, they must be:

- Agreed with Arboricultural Clerk of Works; and
- Adhere to a task specific Arboricultural Method Statement.

5.8.1 Veteran tree ref. T139

T139 is a veteran elder tree (*Sambucus nigra*). This tree is sited within the proposed car parking area of the construction compound.

T139 identified as veteran due to the presence of a number of veteran features including extensive stem decay, cavities and crown dieback.

Vegetation within the calculated root protection area (RPA) will be retained and protected in accordance with the planning submission AIA. This will entail the installation of appropriate tree protective fencing sited at the outer margin of the RPA. This CEZ is calculated as 7.5m radius. This fencing shall remain in situ for the duration of the construction phase.

The RPA of this tree in the AIA has been extended to a radius equivalent to 5m from the edge of its canopy as per standing advice from the Forestry Commission and Natural England (2022)².

5.9 Waterbodies

5.9.1 5m Width CEZ / Buffer of Retained Semi-Natural Habitat

All waterbodies will be protected by retaining a 5m width buffer of semi-natural habitat adjacent to them. The outer margin of this buffer will be demarcated by appropriate fencing. The fence shall be installed working from the interior side of the field to minimise disturbance of the 5m wide margin which is to be retained. Prior to installation the ECoW shall check the alignment of the fence to confirm the buffer and the no presence of reptiles that may be disturbed.

Closed board hoarding delimiting the site boundary will be sited at the outer margin of the 5m width retained vegetation buffer adjacent to waterbody bank edges.

No site clearance will occur within this 5m buffer area without prior agreement with the ECoW.

² Forestry Commission and Natural England 2022. Ancient woodland, ancient trees and veteran trees: advice for making planning decisions.

5.9.2 Preventing Impacts of Site Lighting

Closed board hoarding will act as a physical barrier to prevent spill from site lighting impacting the buffer habitat of waterbodies outside of the construction compound.

Where waterbodies are contained in part within the construction compound site lighting will be directed so that light spill does not enter the waterbody 5m buffer.

As per Condition 11d of the planning permission, the location and direction of external artificial lights will be such that the lighting levels within 8.5 metres of the top of bank of the watercourse are maintained at background level (background levels are considered to be a Lux level of 0-2).

5.9.3 Pollution Prevention Measures

No plant will be sited within 10m of any waterbody / ditch unless agreed with the ECoW, water vole CL31 class licence holder, or in accordance with an agreed Precautionary Method of Works.

No refuelling will occur within 10m of any waterbody / ditch.

The pollution prevention measures detailed within the Construction Environmental Management Plan will be adhered to. These will be in accordance with:

- CIRIA C532 - Control of water pollution from construction sites. Guidance for consultants and contractors
- CIRIA C648 – Control of Water Pollution for linear construction projects Technical Guidance
- CIRIA C649 – Control of Water Pollution for linear construction projects site guide
- Adhere to the conditions stipulated in all site specific Environmental Permits and / or Flood Risk Activity Permits

5.9.4 Construction Activities within Waterbodies and their 5m CEZ

Several structures will require to be installed within the waterbody 5m CEZ. Although limited, this may include works to the waterbody bank and channel. Examples include the installation of a temporary water outfall and temporary bridge.

Where necessary, habitat manipulation will be undertaken in advance of the works to displace water vole from the required section of bank to allow structures to be installed.

It is preferred that a suitable section of ditch not supporting burrows will be used for these works – The ECOW will be deployed in order to identify the least impacting sections of the watercourse for such temporary infrastructure to be located. In the event that is not possible to avoid water vole habitat then habitat manipulation in accordance with class licence CL31³ will be used to prepare the construction site.

The timing for habitat manipulation works is during the spring period from 15 February to the 15 April or during the autumn period from 15 September to the 31 October. Works will not occur under the following conditions:

³ [Licence to intentionally damage or destroy water vole burrows by displacement \(CL31\)](#)

- Ambient temperatures are below 5°C
- Snow is on the ground
- During heavy frost

When habitat manipulation has been completed the area that has been subject to displacement activity will be managed to maintain the work area in a condition that discourages water voles returning, especially when habitat manipulation is completed in the Spring. Such works will adhere to a Precautionary Method of Works.

5.10 Water voles

Water voles are known to utilise the ditches within and adjacent to the Gravesend Site.

In general, the 5m width retained semi-natural habitat adjacent to waterbodies will provide an adequate CEZ to safeguard water voles from construction related impacts. Where necessary habitat manipulation will be undertaken to displace water voles in advance of construction works within the 5m CEZ. Any such works will be carried out in accordance with an appropriate licence and under ECoW supervision.

6 Location of Construction Works

Figure 1 identifies:

- The operating boundary
- Waterbodies and 5m CEZ
- T139 and 10m and 7.5m CEZs
- Proposed location of temporary bridge
- Location where site perimeter fencing will cross waterbodies
- Access routes
- Site set up for construction phase



Figure 1 Indicative location of the construction works, extent of site clearance and all buffers / CEZ associated with biodiversity protection.

7 Practical Measures to Reduce Construction Impacts to Habitats and Species

7.1 Timing of works

Wherever practicable construction activities, including site clearance will be programmed to occur within the optimum season. This will vary depending on species and habitat impacted.

Table 2 provides an indicative programme within which site clearance will occur and thus minimising impacts to protected species and habitats. Where site clearance works occur outside of the optimum time frames stated they will proceed when:

- In accordance with an agreed PMoW or a species / habitat specific Ecological Method Statement;
- Under appropriate supervision of the ECoW; or
- In accordance with a protected species licence granted by Natural England.

The objective during site clearance will be to remove all sensitive habitats and ecological receptors from within the construction area other than the CEZ detailed in [Section 6](#) of this report.

Table 2 Optimum seasons for removing specified species and / or their habitats

Impacted species	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April
Badger sett closure																
Bat PRF inspection																
Bats summer / day roost closure																
Bats - maternity roost closure																
Bats - hibernation roost closure																
Breeding birds																
Reptiles - habitat clearance																
Reptiles -hibernacula destructive search																
Water vole displacement																
Managing water vole displacement areas																

7.2 Construction Area Free of Ecological Constraints

A key objective of the proposed site clearance is to create a construction compound that is free of ecological constraints in a controlled manner that prevents breach of wildlife and habitat legislation. This will permit the construction works to be delivered in accordance with the optimum construction programme, whilst minimising impacts upon ecological receptors.

As identified in [Section 6](#) ecological CEZs will be established and maintained within the site extents. These will be subject to regular inspection by the ECoW and amended as required - thus managing the ecological interface during the construction phase.

Installation of closed board hoarding at the site perimeter will provide a barrier at the site margin reducing the risk of wildlife entering the works area. Construction activity will act as a further deterrent. A mowing regime of surrounding vegetation will also be implemented in order to dissuade species such as reptiles from entering the construction compound.

7.3 ECoW Presence During Construction Works

7.3.1 Incidental Ecological Finds

A suitably trained and experienced ECoW will undertake regular walkovers across the construction site during the period from 1st March to 31st October to ensure any incidental finds of protected species are recorded.

The ECoW will be able to identify and implement suitable CEZs to manage the ecological risk posed.

7.3.2 ECoW Supervision of Construction Activities

The activities defined below will require the supervision of an ECoW and works may need to be implemented in accordance with a PMoW and / or protected species mitigation licence:

- Vegetation clearance works;
- Turf and topsoil stripping;
- Destructive search of reptile hibernacula;
- Closure of confirmed bat roosts if identified by future surveys;
- Works within a biodiversity protection zone as detailed in [Section 6](#);
- Fence installation at the outer margin of the 5m width waterbody CEZ;
- Installation of the temporary bridge and water outfall within a waterbody;
- Fence installation across waterbodies and the associated 5m CEZ; and
- Periodic assessment of site lighting to determine that light spill does not impact the waterbody buffer, T139 CEZ or any other sensitive ecological features.

8 Construction Programme

Construction at the site will commence in 2025 and run until approximately 2029. The indicative tunnelling programme is shown in Table 3.

Table 3 Indicative Construction programme

Activity	Start	Finish
Site Access	Q1 2025	
Design and Development	Q4 2024	Q3 2025
Initial Surveys	Q1 2025	Q4 2025
Site Set-up	Q1 2025	Q3 2025
Shaft Sinking – Tilbury	Q3 2025	Q1 2026
Shaft Sinking – Gravesend	Q1 2026	Q3 2026
Tunnel Construction	Q1 2026	Q4 2026
Mechanical Electrical Plumbing (MEP) works	Q3 2026	Q1 2029
Completion	Q1 2029	

Table 4 Phasing plan

Phase	Key Activities	Ecological Considerations
Pre-development works	Site clearance, Hoarding installation, Access set up	Bird nesting, waterbody, water vole habitat, reptiles, tree protection
Early works	Compound set-up Site set-up Temporary bridge installation Water outfall installation	Water voles' displacement license Reptiles' hibernation
Development works	Shaft sinking excavation Tunnel Boring Machine (TBM) removal MEP works	
Soft Landscaping	Habitat creation	Installation of eight refugia piles for reptiles, mowing regime

The key activities specified above will require the supervision of an ECoW and works may need to be implemented in accordance with a PMoW and / or protected species mitigation licence. Flexibility will be maintained as practical to adapt the programme in response to on-site ecological findings or changing conditions.

9 Roles and responsibilities

9.1 Table of roles and responsibilities

The JV Project Director is responsible for the implementation of landscape and ecology management during the construction of the development. Many members of the FBJV also have responsibility for elements of landscape and ecology management appropriate to their function, experience and seniority. The JV Ecological Clerk of Works (ECoW) will lead on ecology management and act as the key advisor on all related matters including compliance with the plan.

Table 5 provides details of the personnel working on the project with specific responsibilities in relation to ecology and landscape management.

Table 5 Role and Responsibilities

Role Title	Responsibilities
Project Director	Provide adequate environmental resources and support to effectively deliver the requirements of this plan.
Project Manager	- Work to comply with the approved LEMP requirements and principles during the construction phase. - Work to aim method statements conform to the requirements of the LEMP. - Liaise with Environmental and Sustainability Manager on all environmental issues as appropriate. - The reporting of environmental incidents to the Environmental and Sustainability Manager according to agreed procedures.
Environmental & Sustainability Manager	- Develop and implement the LEMP. - Identify and maintain compliance with the requirements and principles of the LEMP during construction. - Assist lead auditors in auditing the LEMP - Identify, develop and provide environmental training as required specific to the LEMP. - Monitoring and assessing the landscape related elements of the approved LEMP for their effectiveness following commencement of operation of the development. - Liaise/meet with external stakeholders.
Ecological Clerk of Works	- Supervise key stages of both habitat clearance and habitat creation works. - Provide technical support on ecology matters and requirements for compliance with relevant legislation and protected species licenses. - Undertake/oversee site surveys and watching briefs. - Advise on ecological protection measures. - Approve method statements and consider LEMP requirements. - Advise and instruct construction teams in the event of incidents and complaints.
Environmental Advisors	- Inspections on compliance with the LEMP requirements. - Brief LEMP requirements to relevant teams. - Advise and guide project team in the implementation of ecology protection measures.

	• Identify ideas for improvement to environmental manager for consideration. • Report best practice across the project. • Assist in incident investigations and reporting. • Encourage near miss reporting and identify trends.
Site Manager	• Work to ensure that the site activities are undertaken in accordance with agreed methods and briefings. • Appropriately manage the significant ecological aspects identified for the Project • Comply with environmental incident investigation and reporting procedures as appropriate.
All Personnel	• Carry out the works in accordance with agreed methods and briefings. • Report anything that deviates from agreed processes. • Attend Project induction.

9.2 Communication

The Environmental and Sustainable Manager will be the key point of contact for ecological interface. They will hold bi-weekly progress meetings with the ecological consultant as required and ecological constraints will be included in the daily briefings where required with the ECoW and supporting ecological specialists.

The Environmental and Sustainability Manager will report to the Project Director and key construction staff as identified in the organisation chart.

The ECoW will liaise with the Environmental and Sustainability Manager as required and report any changes to the ecological baseline as soon as reasonably practical.

The construction team will be involved in the development of the LEMP and its appendix and will be briefed with the agreed requirements including the results of the surveys and ongoing ecological monitoring. Environmental information on ecology will be displayed in offices, site cabins and at sensitive locations to increase awareness of specific ecology matters. The JV Environmental Team, the ECoW and the JV construction team will deliver ecology themed toolbox talks to site and office teams making use of best practice materials from parent companies, specialist environmental / ecological subcontractors and organisations such as CIRIA.

9.3 Project Organisation Chart

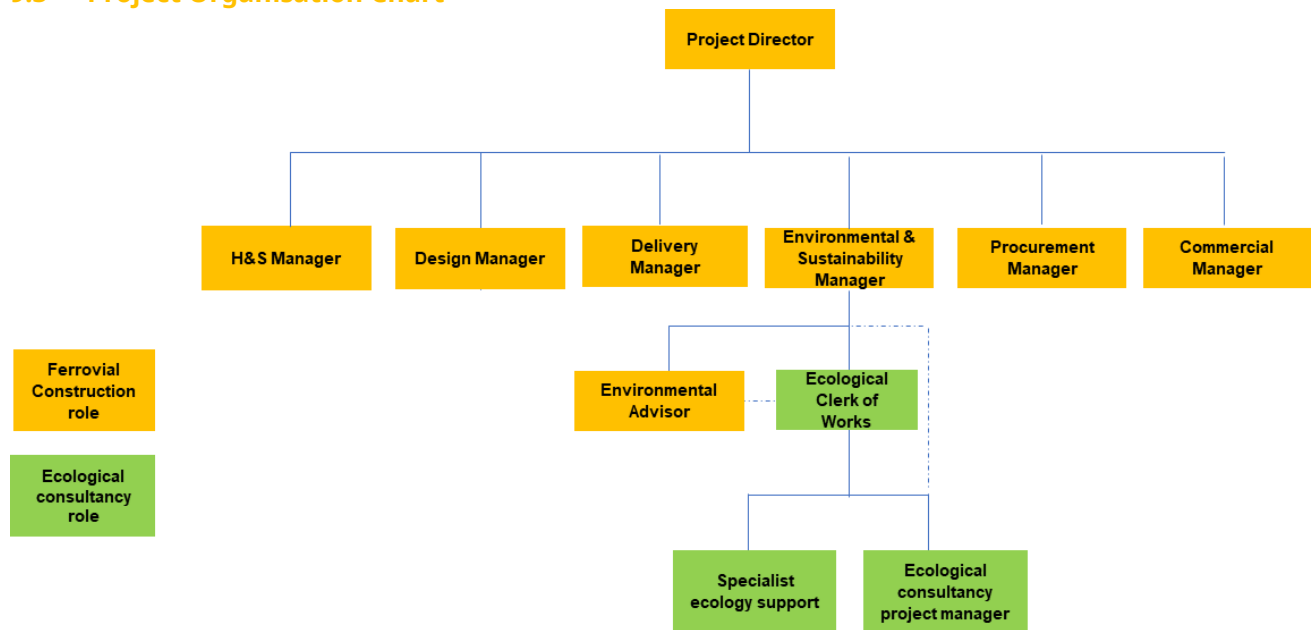


Figure 2 Project organisation chart

9.4 ECoW Responsibilities

The ECoW will be advising FBJV on ecological matters and requirements for compliance with relevant legislation and protected species licences. The ECoW will:

- Supervise key stages of both habitat clearance and habitat creation works;
- Provide technical support on ecology matters and requirements for compliance with relevant legislation and protected species licenses;
- Undertake/oversee site surveys and watching briefs;
- Advise on ecological protection measures;
- Approve method statements and consider LEMP requirements; and
- Advise and instruct construction teams in the event of incidents and complaints.

In addition to the above the ECoW will:

- Carry out site inspection when required to audit the works, including record keeping;
- Act as a central point of contact between the construction and ecology teams;
- Provide site workers with relevant TBT;
- Keep records of TBT and relevant site actions e.g. undertaking nesting bird checks.

10 Ecological Design Strategy Overview

10.1 Scope

The Ecological Design Strategy (EDS) is required to discharge planning Condition 12 of the Decision Notice ref. 20231313. The EDS should incorporate, where feasible, some of the information that has already been outlined in this document.

To prevent duplication, condition parts 12d, 12h, 12i and 12k are elaborated on preceding sections as indicated in Table 6.

Table 6 Conditions detailed in preceding sections.

Condition	Detail	Plan Section
12 d	Description and evaluation of features to be managed	4 & 5
12 h	Extent and location/area of proposed works on appropriate scale maps and plans	6
12 i	Full details of the extent of appropriate buffers (as set out by a suitably qualified ecologist) for protected and priority species;	5
12 k	Timetable for implementation demonstrating that works are aligned with the proposed phasing of development;	0

11 Ecological Surveys

11.1 Ecology Surveys Update (Condition 12a)

Updates to previous surveys have been carried out in 2025 for the development site in accordance with best practice.

Surveys have been carried out by suitably trained and experienced ecological consultants on behalf of FBJV.

Off-site compensation and BNG sites are being provided for by the Royal Society for the Protection of Birds (RSPB) - who will monitor and survey those sites in perpetuity.

11.2 Guidance On Ecological Data Validity

The Chartered Institute of Ecology and Environmental Management (CIEEM) identifies that the validity of survey data, depends on the species being surveyed, and that survey data is typically valid for approximately 18 months – 3 years. Survey data may be valid for a shorter period of time than this under the following circumstance:

- Where a site may offer existing or new features which could be utilised by a mobile species within a short timeframe e.g., bat roosts;
- Where a mobile species is present on site or in the wider area, and can create new features of relevance to the assessment e.g. badgers; and/or
- Where species specific guidance dictates that additional surveys are required

If data does not meet these exemptions, then it may be valid for up to three years. The guidance states that if more than 18 months elapses, it is recommended that an ecologist will need to

undertake a site visit and may also need to update the desk study information for the development. The ecologist would then review the validity of the report/survey effort and advise on frequency of re-survey.

11.3 Pre-Construction Phase Monitoring

To ensure compliance with ecological regulations and to monitor the impact of the construction activities on the local environment, a comprehensive calendar of surveys is underway. These surveys will be conducted at various stages of the pre-construction phase (see Table 7) in the following sequence:

- Initial habitat assessment and baseline species survey to identify existing ecological features and species present on site;
- Follow-up surveys to monitor any changes in species presence and habitat conditions. This will also involve specific surveys for nesting birds during the breeding season;
- Invasive species survey to detect and plan for the management of any non-native species that could affect the construction activities; and
- Final pre-construction survey to update the ecological baseline data and ensure all protective measures are in place before construction begins.

Table 7 Indicative Pre-Construction Phase Monitoring Calendar

TKRE Programme	Jan	Feb	Mar	Apr	May	June	July	Aug
Reptile survey updates								
INNS/Notable & Rare Plant Survey**								
Badger survey update 2025								
Water vole update 2025								
Tree Survey**								
Invertebrate								

11.4 Construction Phase Ecology Survey Schedule

The schedule will include ongoing regular monitoring of species presence and habitat conditions during the construction phase to promptly address any unanticipated ecological issues.

12 Purpose and Conservation Objectives of the Works (Condition 12b)

The monitoring during the construction phase will ensure that the ecological mitigation measures are maintained. This will include periodic site visits during the key construction activities to ensure any changes in the ecological features are recorded and addressed accordingly. Flexibility will be maintained as practical to adapt the programme in response to on-site ecological findings or changing conditions.

13 Review of Site Potential and Constraints (Condition 12c)

An Ecological Opportunities and Constraints report has been produced to identify them at Gravesend site, based on a review of existing baseline ecological report, and identify requirements for further updated surveys and / or ecological mitigation. The full report is included in [Appendix A](#).

14 Reptile Mitigation (Condition 12e)

14.1 Reptile PMoW

A PMoW is part of the overall Gravesend PMoW (RIV003-001-002/001/001) which outlines the site-specific procedures and measures to be implemented during pre-construction. The Reptile PMoW details the means by which reptiles will be safeguarded from impacts associated with pre-construction phase activities, including vegetation clearance for borehole drilling, ground investigation works, installation of welfare units and site perimeter hoarding. A Reptile Mitigation Strategy ([Appendix B](#)) has been devised by Thomson 2025 to cover the main construction phase.

14.2 Reptile Mitigation Strategy

The detail of the reptile mitigation strategy is summarised below.

14.2.1 Timing of Site Clearance

Site clearance works will be carried out during the reptile active season. This is considered to be from March to October, though a destructive search will happen no later than September to allow reptiles sufficient time to disperse and find suitable refugia for hibernation.

14.2.2 Retained Habitat

A 5m width buffer of suitable reptile habitat will be maintained at the margins of the waterbodies / ditches within the site extents. Retention of this existing vegetation will maintain connectivity with suitable habitat outside of the scheme extents and facilitate natural dispersal of reptiles to the wider environment. This buffer will be separated from the works site by board solid fence.

Due to the nature of the watercourses on site, installation of plastic reptile fencing is not considered appropriate. The installation of closed board solid hoarding/fencing will minimise the risk of reptiles re-entering the works area during the construction. Surrounding vegetation will be kept short to further discourage any re-entry of reptiles into the construction compound

14.2.3 Clearance of Reptile Habitat (Construction Phase)

AECOM (2024)⁴ identified that the nature of the habitats suitable for reptiles currently present within the site contain a long grassland sward that is suitable for foraging but with limited basking and refugia habitats. Habitat of such a condition is therefore likely to have a limited carrying capacity and indicates that a low population of reptiles is present across the site. Updated habitat suitability assessment confirmed the site has low suitability for reptiles.

The updated baseline reptile population data from 2025 surveys (Thomson, 2025) supported the AECOM 2023 results that there are low numbers of common species of reptile (including common lizard and grass snake) present on site, and a moderate population of slow worm. The Reptile Mitigation Strategy ([Appendix B](#)) covers the Construction Phase of the works and includes a two-staged cut displacement methodology with additional off-site compensation and habitat enhancement measures for reptiles.

⁴ Response to Ecological Points Raised in KCC Advice to Gravesham BC Dated 27 February 2024, AECOM.

14.3 Reptile Enhancement area

The neighbouring parcels of land to the north-east of site will be used as a reptile enhancement area. Eight brush/ log piles will be installed along the perimeter of these fields to further increase the carrying capacity for common species of reptile. A cutting regime will be implemented in order to maintain a more diverse sward height suitable for reptiles. Full details are included in Appendix B; Reptile Mitigation Strategy.

This is detailed within Section 14.2.3 above.

14.3.1 Operational phase

Any measures for the long-term benefit of reptiles (during the operation of the project) will be detailed within the next submission of this plan- following completion of the Landscape and Ecological Mitigation Design. The second stage LEMP will be submitted for approval prior to the commencement of the construction of permanent above ground structure on site.

15 Soft Landscaping Design (Condition 12f)

The soft landscaping design will be progressed during the construction phase. Further detail will be provided in the second submission of the LEMP – to be submitted for approval prior to the commencement of the construction of permanent above ground structure on site.

16 Ecological Mitigation Features (Condition 12g, 12m, 12n)

These will be designed during the construction phase. Further detail will be provided in the second submission of the LEMP– to be submitted for approval prior to the commencement of the construction of permanent above ground structure on site.

17 Organisational Responsibility for Implementation of the EDS (Condition 12l)

17.1 Construction phase

Implementation of the EDS will be the responsibility of FBJV during the construction phase.

FBJV's responsibilities will be limited to:

- Renewal of ecological and environmental surveys where deemed required within site extents prior to site clearance;
- Implementation of the mitigation to prevent impact to sensitive ecological receptors, habitats and environmental features contained within the site extents as detailed in [Sections 5](#) and [14](#) of this plan.
- Regular ecological and environmental inspection of the site to ensure that ecological and environmental mitigation implemented is maintained as intended;
- Should any incidental ecological / environmental finds come to light they are mitigated appropriately; and

- Construction of the landscape and ecological mitigation design prior to the operational phase.

17.2 Operational phase

National Grid will be responsible for the establishment, medium- and long-term management of the completed landscape and ecological mitigation designs.

The detail of these management activities will be provided by National Grid in the second submission of the LEMP – to be submitted for approval prior to the commencement of the construction of permanent above ground structure on site.

18 Ecological Monitoring (Condition 12o)

18.1 Construction phase

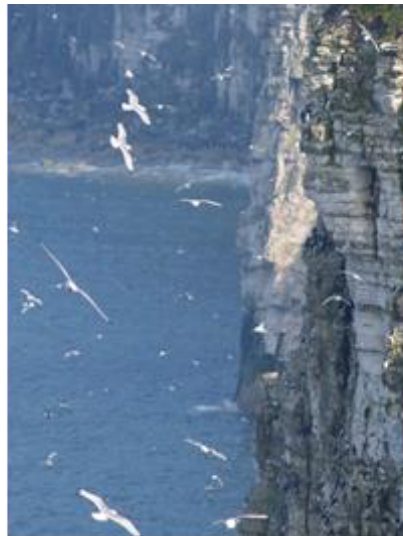
Ecological monitoring of sensitive ecological features within the site extents will occur during the construction phase.

Regular ecological and environmental inspection at the key stages of the proposed development of the Project will occur to ensure that ecological and environmental mitigation implemented is maintained as intended. Records will be maintained and stored within the project data management system.

18.2 Operational phase

An appropriate ecological monitoring strategy will be provided by National Grid in the next submission of the LEMP - to be submitted for approval prior to the commencement of the construction of permanent above ground structure on site.

Appendix A - Ecological Opportunities



**Ecological Opportunities &
Constraints Report**

**Grain to Tilbury Tunnel -
Gravesend Site**

For

Ferrovial BEMO Joint Venture

Project No.: RIV003-001/001/002/001

July 2025

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RIV003-001	002

Revision No.	Date of Issue	Author	Reviewer	Approver
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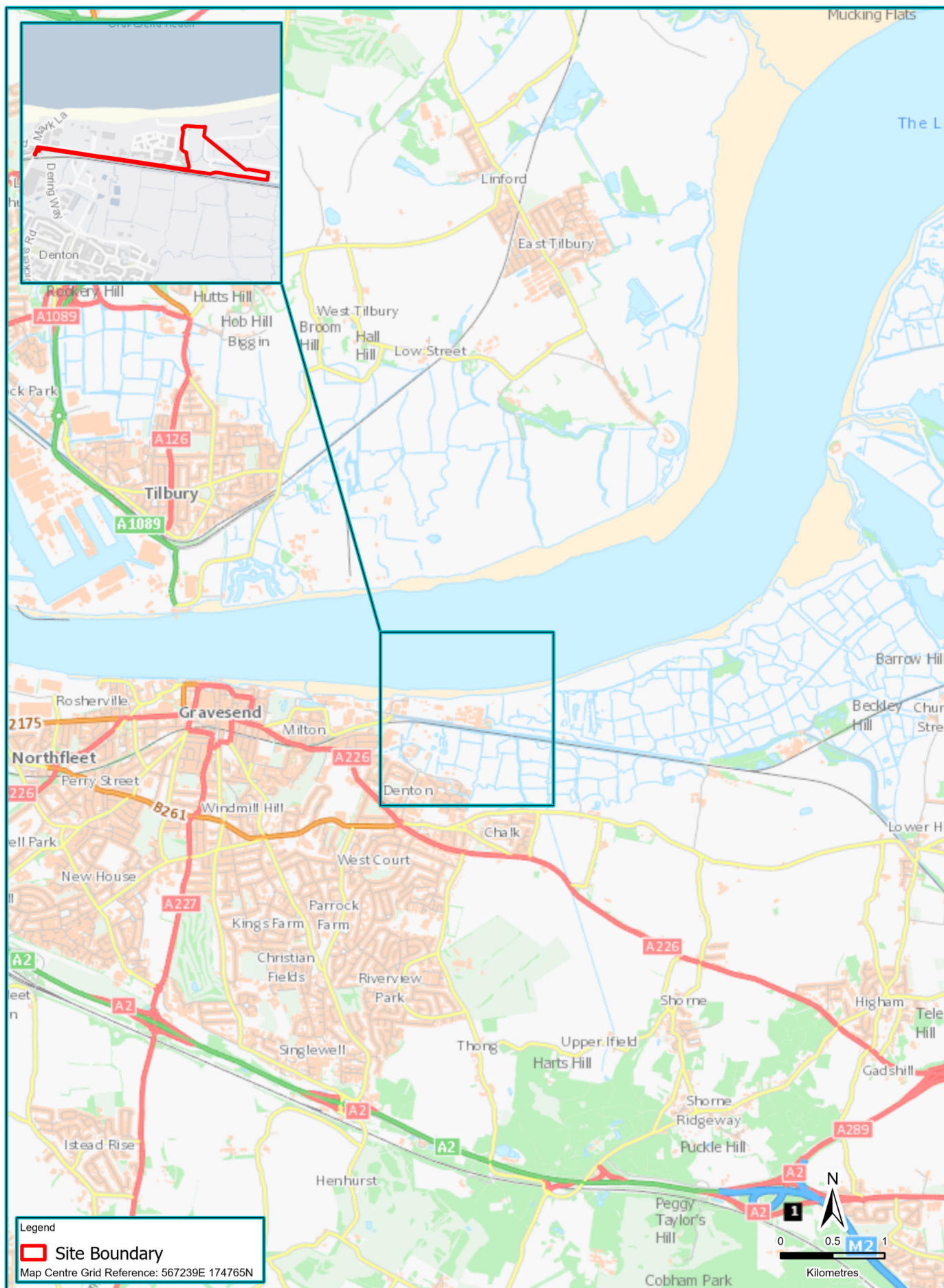
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Client	Ferrovia BEMO JV		Drawing Ref	RIV003-001/407138/1	
Figure Number	1		Scale at A4	1:50,000	
Figure Title	Site Location		Drawn	JTW	Checked
			Date	15/05/2025	Date
				AS	15/05/2025

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1. Summary

- 1.1.1** Ferrovial BEMO (FBJV), on behalf of the National Grid, are proposing electricity infrastructure upgrades, including the construction of a new forced ventilated tunnel shaft underneath the Thames that will house new cable circuits.
- 1.1.2** The development will be located on the Lower Thames Estuary, covering Tilbury, Essex to Gravesend, Kent with above ground components located at the two sites. This report specifically relates to the above ground site at Gravesend. The site location is shown on Figure 1.
- 1.1.3** Thomson Environmental Consultants were commissioned to identify ecological constraints and opportunities at the Gravesend site, based on a review of existing baseline ecological reports, and identify requirements for further updated surveys and / or ecological mitigation.
- 1.1.4** The Ecological constraints and opportunities identified and associated recommendations are summarised in Table 1 below.

Table 1.1: Summary of ecological constraints and opportunities

Ecological Receptor	Potential constraints	Potential impacts / Recommendations for further survey / mitigation / timings	Opportunities for enhancement
Statutory designated sites	Thames Estuary & Marshes Special Protection Area (SPA), Site of Special Scientific Interest (SSSI) & Ramsar Site. Mucking Flats Marshes SSSI. South Thames Estuary and Marshes SSSI	No significant impacts anticipated. Pollution prevention guidelines must be followed during construction (Environment Agency, 2012). HRA conducted by AECOM is still valid. No further surveys required.	N/A
Non statutory designated sites	Canal and Grazing Marsh, Higham Local Wildlife Site (LWS). A226 Gravesend Road. Chalk Roadside Nature Reserve (RNR) GR01 Nr Queens Farm.	The effects of the proposed development on these sites are temporarily adverse and long term. Not significant impacts. No further recommendations are required.	N/A

Ecological Receptor	Potential constraints	Potential impacts / Recommendations for further survey / mitigation / timings	Opportunities for enhancement
Watercourses on site	Ditches present on site linking to neighbouring LWS	Pollution prevention guidelines near watercourses must be followed (Environment Agency, 2012). Contact Environmental Agency for permits in terms of altering any of the ditches / discharging waste water in order to appropriately assess impact.	Ditch enhancement to be proposed as part of the water vole license and detailed within a Landscape Ecological Management Plan (LEMP).
Invertebrates	Four Species of Principal Importance (SPI) recorded during the 2023 surveys, namely hornet robberfly, shrill carder-bee; brown-banded carder-bee, and small heath butterfly.	The effects of the proposed development on invertebrate species are temporarily adverse and long term. Not significant. No further recommendations.	Invertebrates will benefit from grassland reinstatement, habitat creation as well as enhancements designed to increase the condition of habitats on site. Brown roof creation on headhouse to benefit invertebrates.
Reptiles	Slow worm, common lizard and grass snake are present on site.	Impacts are predicted in the absence of mitigation. Update baseline surveys currently being undertaken (April to June, 2025) to identify population estimates in each suitable habitat parcel on site. Mitigation strategy to be devised following completion of surveys in June 2025. Two-staged clearance displacement approach is feasible in small areas to be cleared. Potential fencing and translocation required in larger areas.	Installation of log and brash pile refugia & hibernacula on site. Native planting, re-landscaping post construction and habitat creation. Habitat creation and enhancement at reptile receptor site also required.
Badger	Signs of badger recorded on site, no setts recorded.	Walkover survey recommended three months prior to construction taking place to identify any new setts and assess current usage. Impact assessment and mitigation method statement for license application for sett closures may be required if impacts cannot be avoided on an active sett.	Badger will benefit from grassland reinstatement and creation as well as enhancements designed to increase the condition of habitats and the invertebrate population.
Bats	One tree with high bat potential on site (T139)	No further survey effort is proposed. Tree to be retained and protected from adverse impacts throughout construction and operation of the site.	Post construction native planting, habitat creation, condition enhancements and invertebrate features

Ecological Receptor	Potential constraints	Potential impacts / Recommendations for further survey / mitigation / timings	Opportunities for enhancement
		Should the scope of works change and the tree will be impacted then an updated Ground Level Tree Assessment and three inspections of the suitable features for roosting bats will be required prior to felling. Lighting strategy to be adopted to minimise lighting during construction phase (covered under a separate planning condition).	detailed within the LEMP will benefit foraging bats.
Birds	Breeding birds such as Cetti's warbler (Schedule 1) recorded on site. Locally important non-breeding birds. Intertidal waders gadwall, lapwing and whimbrel (all SPA 4.2 species) and grey plover, ringed plover; dunlin; redshank present between the two sites.	The effects of the proposed development on bird species are temporarily adverse and long term Not significant.	Post construction enhancements detailed within the LEMP will also benefit nesting birds.
Water Vole	Water vole located on site, present in all ditches.	Update baseline surveys currently being undertaken (March to September 2025). Key to identify presence in all ditches and identify sensitive burrow locations in order to maintain suitable buffers. Requirement for a displacement mitigation license from Natural England for the creation of a headwall and discharging waste water.	Ditch enhancement will be proposed in line with the license requirements which may include scrub clearance, marginal aquatic planting and selective tree removal to reduce shading.

2. Introduction

Development Background

- 2.1.1** FBJV, on behalf of the National Grid, are proposing electricity infrastructure upgrades. The proposals will include the construction of a new headhouse and Sealing End Compound, access roads and utilities, drainage and lighting. This will form part of a wider suite of infrastructure upgrades and reinforcements planned by National Grid as part of The Great Grid Upgrade.
- 2.1.2** The development will be located on the Lower Thames Estuary, covering Tilbury to Gravesend with the above ground components located at two sites, Tilbury in Essex to the north of the River Thames and Gravesend in Kent to the south of the River Thames. This report specifically relates to the Gravesend site only; site location is shown on Figure 1.
- 2.1.3** The following above-ground components of the newly bored tunnel are anticipated:
- A new cable sealing end compound (SEC): consisting of:
 - A new tunnel headhouse which will cover the shaft into the tunnel;
 - A new overhead line gantry structure which will connect the overhead line download conductors and transfer them to six sealing end structures; and
 - Modifications to the existing overhead line (OHL): The new OHL conductors will be connected to the existing TKRE 400kV OHL conductors via new terminal pylons. The old OHL conductors and existing pylons will be either replaced, refurbished or removed.
- 2.1.4** The Proposed Development comprises a permanent footprint of approximately 0.023 hectares (ha) in Gravesend, Gravesham, (grid ref approximately TQ 67455 74158) and a temporary footprint of approximately 3.71 ha. It is located within the Canal and Grazing Marsh, Higham Local Wildlife Site (LWS), designated for its grassland habitats and on land owned by National Grid. See Figure 1.
- 2.1.5** The area affected by the development is hereafter referred to as the “site”.
- 2.1.6** Planning permission for the development (23/01502/FUL) has been granted by Gravesham council, subject to a conditions. Planning conditions 10, 11 and 12 all relate to the mitigation, management, compensation and supervision required to be approved by the local planning authority before the works commence.
- 2.1.7** **“Planning Condition 10. Construction Ecological Management Strategy (CEMS) - Biodiversity/Biodiversity Method Statement**

No development approved by this permission shall take place (including any site/vegetation clearance) before a construction ecological management strategy (CEMS - biodiversity) has

been submitted to and approved in writing by the local planning authority. The CEMS - biodiversity shall be based on the avoidance, mitigation and compensation measures indicated within the ecological information submitted with the planning application. The CEMS - biodiversity shall include the following:

- a. Risk assessment of potentially damaging construction activities;*
- b. The identification of biodiversity protection zones and the use of protective fences, exclusion barriers and warning signs. This shall include a suitable buffer zone(s) (as set out by a suitably qualified ecologist) for relevant protected and priority species;*
- c. Extent and location of proposed works shown on appropriate scale maps and plans for all relevant species and habitats;*
- d. Practical measures (both physical measures and sensitive working practises) to avoid or reduce impacts during construction (may be provided as a set of species or habitat-specific method statements);*
- e. The location and timing of sensitive works to avoid harm to biodiversity features;*
- f. Timetable for implementation, demonstrating that works are aligned with the proposed phasing of construction;*
- g. The times during construction when specialist ecologists need to be present on site to oversee works;*
- h. Details of any necessary protected species licences or reference to other relevant documents as required (e.g., Arboricultural Method Statement/ updated species survey reports/ecological design strategy);*
- i. Responsible persons and lines of communication; and*
- j. The role and responsibilities on site of an ecological clerk of works (ECoW) or similarly competent person.*

The approved CEMS - biodiversity will be adhered to and implemented throughout the construction period (and beyond if required) in accordance with the approved details.

Reason: To ensure that construction of the development does not cause harm to biodiversity or ecology including protected species in accordance with Policies CS12 and CS19 of the Gravesham Local Plan Core Strategy (2014) and section 15 of the National Planning Policy Framework (2024)."

2.1.8 Planning Condition 11. Landscape Ecological Management Plan (LEMP)

No development approved by this permission shall take place until a Landscape Ecological Management Plan (LEMP), including long-term design objectives, management responsibilities and maintenance schedules for all wetland and ditch habitats has been submitted to, and approved in writing by, the Local Planning Authority.

The LEMP shall be carried out as approved and any subsequent variations shall be agreed in writing by the local planning authority.

The LEMP shall include the following:

- a. Details of treatment of operational site boundaries and/or buffers around water bodies; an adequate buffer zone extent (i.e. to provide good forage and shelter for water voles) to be identified and demarked on a scaled map;*
- b. Details demonstrating how the buffer zone will be protected during development;*
- c. Details of how any permanent proposed footpaths, fencing, lighting, and other aspects of the development may interact with the wetland or ditch habitats; the applicant should note that artificial light spill should be directed away from ecological receptors, sensitive lighting design guidance can be accessed via the Bat Conservation Trust;*
- d. No light spill from permanent external artificial lighting into the watercourse or adjacent river corridor habitat. To achieve this the specifications, location and direction of external artificial lights should be such that the lighting levels within 8.5 metres of the top of bank of the watercourse are maintained at background level (background levels are considered to be a Lux level of 0-2);*
- e. Details of maintenance regimes; including specific treatment of the ditch buffer zone and new wetland habitats;*
- f. Details of any new wetland and ditch habitat created on-site, including any proposed planting scheme should be provided. Planting schemes should use native species, suited to the catchment character and management responsibilities should be provided.*

Reason: To ensure the protection of wildlife and the supporting habitat and to secure opportunities for enhancing the site's nature conservation value, promoting positive conservation status for water vole in the area and to complement achievement of the proposed Biodiversity Net Gain ambition in accordance with Policy CS12 of the Gravesham Local Plan Core Strategy (2014) and section 15 of the National Planning Policy Framework (2024).

2.1.9 Planning Condition 12. Ecological Design Strategy

No development approved by this permission shall take place (including any site/vegetation clearance) before an Ecological Design Strategy (EDS) has been submitted to and approved in writing by, the Local Planning Authority. The EDS shall ensure that on-site compensatory habitat is provided for relevant protected and priority species (as determined by a suitably qualified

ecologist). The EDS shall ensure that both on and off-site compensatory habitat is provided for the projected permanent and temporary loss of reptile habitat (as identified in the AECOM Technical Note: Response to Ecological Points Raised in KCC Advice to Gravesham BC Dated 27th February 2024 (24th July 2024 Rev02). The EDS shall ensure the mitigation and compensation measures with regards to habitat improvements proposed, and the area of land required, are based on available scientific research and government standing advice. If the proposed compensation site already has an existing population of the relevant species and/or is already proposed as compensation for other development, evidence shall be provided to demonstrate that the measures proposed are additional. The EDS shall include where practical the following:

- a. Up-to-date survey data carried out in accordance with best practice for the both the development site and the proposed off-site compensation site(s);*
- b. Purpose and conservation objectives for the proposed works;*
- c. Review of site potential and constraints;*
- d. Description and evaluation of features to be managed;*
- e. Detailed design(s) and/or working method(s) to achieve stated objectives. This shall include a detailed methodology for the movement of reptiles and measures to prevent reptiles returning to the site prior to and during the development. This shall also include details of how any receptor sites will be enhanced and be in a suitable condition to support the likely number of animals which will be moved, prior to any animals being moved, and details of the management of the compensation site(s) in perpetuity.*
- f. Full details of soft landscape works, to include species, size and location of new habitats (e.g., trees, shrubs, hedges and grassed areas to be planted) with the extent and location/area of proposed works shown on appropriate scaled maps and plans;*
- g. Full details of the proposed ecological features. For habitat boxes details shall include numbers, make and model, locations to include height, aspect and mounting location shown on scaled landscaping plans suitable for construction. For log piles and hibernacula details shall include materials, size, shape and construction methodology. Locations shall be shown on scaled landscaping plans suitable for construction;*
- h. Extent and location/area of proposed works on appropriate scale maps and plans;*
- i. Full details of the extent of appropriate buffers (as set out by a suitably qualified ecologist) for protected and priority species;*
- j. Type and source of building materials to be used where appropriate, e.g. native species of local provenance;*
- k. Timetable for implementation demonstrating that works are aligned with the proposed phasing*

of development;

l. Details of the body or organisation(s) responsible for implementing the EDS and the mechanisms for securing the mitigation/compensation land and its management for the lifetime of the development;

m. Details of initial aftercare and appropriate management prescriptions for relevant protected and priority species and habitats (as identified by a suitably qualified ecologist and in accordance with information submitted as part of the application) for the lifetime of the development within a Landscape and Ecological Management Plan;

n. Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five-year period);

o. Details for monitoring (to be undertaken by a suitably qualified ecologist(s)) and remedial measures.

The EDS shall be implemented in accordance with the approved details. All features shall be retained as approved thereafter, unless remedial measures are required. Approval for any remedial measures shall be sought from the Local Planning Authority in writing and thereafter implemented as approved.

Reason: To ensure that construction of the development does not cause harm to species including protected species and their habitat in accordance with Policies CS12 and CS19 of the Gravesham Local Plan Core Strategy (2014) and section 15 of the National Planning Policy Framework (2024).

The Brief and Objectives

2.1.10 FBJV commissioned Thomson Environmental Consultants on 18th February 2025 to prepare an Ecological Opportunities and Constraints Report to identify the baseline ecological issues at Gravesend and highlight the need for any further updated surveys and / or ecological mitigation. This report includes:

- a review of the baseline ES chapters prepared by AECOM;
- identify actions required under Gravesham council's planning conditions (6 and 18) & any other relevant legislation and planning policies;
- identify need for further survey, impact assessment;
- confirm further mitigation requirements following update surveys

3. Ecology Background

- 3.1.1** Historical surveys at Gravesend have included an initial Preliminary Ecological Appraisal (PEA), carried out in November 2022, with updates in 2023 (AECOM, 2023a). A subsequent suite of ecological surveys was also conducted on the site by AECOM during 2022 and 2023; including birds, reptiles, great crested newt, invertebrates, badger, otter and water vole and bats. Environmental Statement chapters were provided and reviewed for each of these species groups. Thomson Environmental Consultants Ltd. have since completed an update walkover survey in February 2025 to confirm that site habitats and conditions remain the same (PMoW report, Thomson 2025).

Designated sites

- 3.1.2** A Habitat Regulations Assessment was completed by AECOM in 2023, and updated in 2024. This was to assess the impact on the nearby designated sites. The report concluded that no adverse impacts on the integrity of the Thames Estuary & Marshes SPA and Ramsar will arise (AECOM, 2023a). This assessment remains the same, and will be confirmed following an updated noise and vibration assessment (May, 2025).

Habitats

- 3.1.3** The original PEA report found the site primarily comprised tussocky semi-improved grassland, amenity grassland, scattered scrub, hard standing, marshy grassland, buildings, running water and line of trees, largely identified as Coastal and Floodplain Grazing Marsh of county importance (AECOM, 2023a). An updated site walkover was conducted in February 2025 by Thomson surveyors and confirmed that habitat conditions remain the same (PMoW Report, Thomson, 2025).

Reptiles

- 3.1.4** Suitable habitat for reptiles on site comprised rough grassland, scrub, ruderal habitats and soil bunds. Reptile surveys carried out by Thomson recorded common lizard, slow worm and grass snake on site. No adder were recorded during the presence/absence survey either by AECOM in 2023 or Thomson in 2025. The Gravesend Site is considered suitable to support up to a 'Good' population of slow worm, a low population of grass snake and common lizard and as such, Gravesend would be considered an 'important' Site in relation to reptile biodiversity and population size.

Nesting Birds

- 3.1.5** Suitable habitat for nesting birds on Site comprised scrub, reedbeds and grassland (AECOM 2023a). A total of 32 species were recorded in the Gravesend Site survey area during 2023 surveys, and of these 22 species were assumed to be breeding. During a site walkover by Thomson Environmental Consultant on the 21st February 2025 suitable nesting bird habitat was identified comprising mixed scrub and bramble scrub mostly concentrated in the north of the site, and around the ditches to the east and south of the site (see Figure 3). Access to the firing range was restricted and therefore additional habitat may also be present.

Bats

- 3.1.6** A single tree with high suitability to support roosting bats was identified within the site (under the superseded bat survey guidelines, 2018). No bats were found to be utilising the tree for roosting during the 2023 surveys, however it continues to have high suitability to support roosting bats in the future. Bat activity and static detector surveys undertaken in 2023 suggest that the Gravesend Site and adjacent habitat is predominately utilised by more widespread bat species such as common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*Pipistrellus pygmaeus*) with more occasional usage by noctule (*Nyctalus noctula*) and Leisler's bat (*Nyctalus leisler*) (AECOM, 2023c). Under the current bat survey guidelines, the tree would be categorised as PRF-M (Collins, 2023).

Badgers and other small mammals

- 3.1.7** Signs of badger were recorded during the field survey (AECOM 2023a). It is noted that the habitats on site are potentially suitable to support setts, and badgers are widespread across Kent.
- 3.1.8** Records for hedgehog were returned within 1km of the site by the Kent Biological Records Centre and the scrub and ruderal habitat on site is suitable foraging habitat for hedgehogs as well as providing shelter for the species during hibernation. Due to the connectivity to suitable adjacent habitat on the site there is potential for hedgehogs to commute on and off site.

Water Vole (*Arvicola amphibius*)

- 3.1.9** The data search from the Kent and Medway Biological Records Centre identified a range of water vole records associated with the wider Gravesend and Higham Marshes area (AECOM 2023a).
- 3.1.10** Previous surveys undertaken for the Lower Thames Crossing found water vole to be present within ditches on the western boundary of the Gravesend site, adjoining the Metropolitan Police Training Centre and extending into the centre of the Gravesend site, with a low population assumed. Water vole were also found to be present within a waterbody directly to the east of the existing substation, on the southern boundary of the Milton rifle range. This waterbody was considered to support a medium population of water vole. The Kent and Medway Canal, to the south of the site, was also found to contain a low population of water vole.
- 3.1.11** Water vole surveys undertaken by AECOM in 2023 found no evidence of water vole recorded although habitat was considered to be suitable and access was restricted by steep bank sides.

Invertebrates

- 3.1.12** Several protected and notable invertebrate species were recorded by a specialist contractor (on behalf of AECOM in 2023) and were recorded on site at Gravesend. An updated ecological survey will be completed in July 2025 to confirm presence of these species and help tailor enhancement recommendations for these specific species.

Protected Plant Species

- 3.1.13** No protected plant species were returned within 1km of the site during the desk study, however 2023 surveys by AECOM identified a stand of divided sedge (*Carex divisa*), a vulnerable, priority species of conservation value, within the Milton rifle range, outside but adjacent to the site boundary.
- 3.1.14** Japanese knotweed (*Reynoutria japonica*) was recorded as present to the north of Wharf Road adjoining the site during the AECOM 2023 surveys. No other INNS were recorded on the site.

4. Legislation

4.1.1 National legislation and planning policy, and local policies, relating to ecology and biodiversity relevant to the proposed works, are summarised below.

4.1.2 This report refers to 'ecological features' which include:

- Statutory designated sites for nature conservation;
- Non-statutory designated sites for nature conservation;
- Priority habitats for nature conservation, including ancient woodland;
- Protected species;
- Species of conservation concern; and
- Invasive non-native species.

Designated Sites

4.1.3 Designated sites for nature conservation are protected under UK legislation. Sites can be classified according to their levels of conservation importance. Sites may be considered of international, national or local conservation importance. Internationally important sites receive the highest level of protection.

4.1.4 Statutory designated sites of international importance include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites¹.

4.1.5 SACs are protected areas in the UK designated under the Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations) in England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters).

4.1.6 SPAs are protected areas for birds in the UK classified under the Habitats Regulations in England, Scotland and Wales.

4.1.7 Paragraph 194 of the National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing & Communities, 2024) states that '*The following should be given the same protection as habitats sites*²:

a) potential Special Protection Areas and possible Special Areas of Conservation;

b) listed or proposed Ramsar sites; and

¹ SACs and SPAs were formally known as European sites forming part of the Natura 2000 site network. Following the UK's exit from the EU they are now referred to as National Sites and are part of the National Site Network. However, these sites can still be considered to be of international importance for nature conservation. Developments affecting these sites must be considered according to the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended).

² Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017 (as amended) for the purpose of those regulations, including candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, Special Protection Areas and any relevant Marine Sites.

c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.'

- 4.1.8** Statutory designated sites of national importance include Sites of Special Scientific Interest (SSSIs) which are protected under the Wildlife and Countryside Act 1981 (as amended) (WCA), Countryside and Rights of Way Act 2000 (CRoW Act) and Natural Environment and Rural Communities Act 2006 (NERC Act). National Nature Reserves (NNRs) are a selection of the very best parts of England's SSSIs, protected under the WCA and CRoW Act.
- 4.1.9** SSSIs are protected by law and planning guidance. Local Planning Authorities in England must consult Natural England on planning applications that might affect SSSIs. Operations that could damage special interests require consent by Natural England. Under the WCA it is an offence to damage, disturb or destroy land within a SSSI or disturb wildlife in a SSSI.
- 4.1.10** Paragraph 193 of the NPPF states that '*When determining planning applications, local planning authorities should apply the following principles: (b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest.*'
- 4.1.11** Natural England's Impact Risk Zones (IRZs) for SSSIs (Natural England, 2024) is a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts. The IRZs also cover the interest features and sensitivities of European sites, which are underpinned by the SSSI designation and "Compensation Sites", which have been secured as compensation for impacts on National Sites. Development proposals situated within IRZs may require consultation between the Local Planning Authority and Natural England to discuss the potential impacts of a proposal upon the designated site.
- 4.1.12** National Parks, the Broads and Areas of Outstanding Natural Beauty are also of national importance. Paragraph 189 of the NPPF states that: '*Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas and should be given great weight in National Parks and the Broads. The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.*'
- 4.1.13** Local Nature Reserves (LNRs) are statutory designated sites of local importance that receive protection under the National Parks and Access to the Countryside Act 1949. Local Planning Authorities are required to consult Natural England about all new proposals. An LNR can be

given protection against damaging operations. It also has protection against development on and around it. This protection is usually given via the Local Plan³, produced by the Local Planning Authority, and often supplemented by local by-laws. Unlike national designations, the level and type of protection afforded an LNR is decided locally and varies from site to site.

4.1.14 The importance of sites of biodiversity value, considered to be synonymous to 'designated sites' is also recognised in Paragraph 187 of NPPF which states that '*Planning policies and decisions should contribute to and enhance the natural and local environment by: a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan).*'

4.1.15 The Gravesham Local Plan Core Strategy 01 section on Sustainable Development - 4.1.7 states: *When considering development proposals the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework and in this Core Strategy. It will work proactively with applicants jointly to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area.*

Priority Habitats

4.1.16 In this report priority habitats for nature conservation include:

- Habitats of Principal Importance listed under Section 41 of the NERC Act;
- Veteran irreplaceable mature elder tree;
- Habitats listed under Local Biodiversity Action Plans (LBAPs); and

4.1.17 Habitats of Principal Importance are listed under the NERC Act. Under Section 41, the Secretary of State must publish a list of the types of habitat which in their opinion are of principal importance for the purpose of conserving biodiversity.

4.1.18 Section 40 of the Act places a duty on all public bodies, including planning authorities, to have regard for biodiversity in exercising their functions. Planning authorities should have particular regard to the Habitats of Principal Importance (henceforth referred to as priority habitats) listed under Section 41 of the Act which should be treated as a material consideration in the planning process.

4.1.19 Paragraph 192 of the NPPF states that to protect and enhance biodiversity and geodiversity, plans should '*promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.*' The NPPF defines 'priority habitats and species' as '*Species and Habitats of Principal Importance included in the England*

³ A plan for the future development of a local area, drawn up by the local planning authority in consultation with the community. In law this is described as the development plan documents adopted under the Planning and Compulsory Purchase Act 2004. A local plan can consist of either strategic or non-strategic policies, or a combination of the two.

Biodiversity List published by the Secretary of State under section 41 of the Natural Environment and Rural Communities Act 2006’.

- 4.1.20** Some habitats are described as ‘irreplaceable habitat’. The NPPF describes these as habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. They include ancient woodland, ancient and veteran trees⁴, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.
- 4.1.21** Ancient woodland is any area that has been wooded continuously since at least 1600AD⁵. Paragraph 193(c) of the NPPF states that *‘When determining planning applications, local planning authorities should apply the following principles: c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists...’*

Protected Species

- 4.1.22** Rare and declining plant and animal species in the UK are generally protected under national legislation.
- 4.1.23** Species protected under the Habitats Regulations⁶ receive the highest level of protection in the UK. These species can be considered to be of international importance because they are rare or declining in Europe as well as in the UK. These species are not only protected from killing and injury, but their breeding sites and resting places are also protected. These species include:
- Great crested newt (*Triturus cristatus*), natterjack toad (*Epidalea calamita*) and pool frog (*Pelophylax lessonae*);
 - Sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*);
 - All bat species;
 - Hazel dormouse (*Muscardinus avellanarius*) and otter (*Lutra lutra*);
 - Large blue butterfly (*Phengaris arion*) (eggs, caterpillars, chrysalises and adults);
 - Fisher’s estuarine moth (*Gortyna borelii*) (eggs, caterpillars, chrysalises and adults); and
 - Little ramshorn whirlpool snail (*Anisus vorticulus*)
- 4.1.24** For the species listed above, the Habitats Regulations make it an offence to:
- Deliberately kill, injure, disturb or capture them;
 - Deliberately take or destroy their eggs;
 - Damage or destroy their breeding sites and resting places⁷; and
 - Possess, control or transport them (alive or dead).

⁴ <https://www.gov.uk/guidance/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions>

⁵ Ancient woodland includes ‘ancient semi-natural woodland’ (ASNW) and ‘plantations on ancient woodland sites’ (PAWS).

⁶ These species are often referred to as European Protected Species (EPS) because the requirement to protect them under national legislation originally derived from the fact that these species are listed under the European Habitats Directive.

⁷ This applies even if the species is not present at the time when the damage or destruction occurs.

4.1.25 The WCA also offers protections. In addition to the species listed above, which also receive some protection under the WCA (Section 9 (1)), protection under this legislation is given to prevent intentional (or reckless in Scotland) killing and injury⁸ of:

- Common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix helvetica*);
- All wild birds; and
- Water vole (*Arvicola amphibius*).

4.1.26 The WCA also provides additional protection for some species also protected under the Habitats Regulations. These species include GCN, sand lizard, smooth snake, bats, dormouse, otter, large blue butterfly, Fisher's estuarine moth and little ramshorn whirlpool snail whereby it is also an offence under the WCA to intentionally or recklessly:

- Disturb while they occupy a structure or place used for shelter or protection; and
- Obstruct access to a place of shelter or protection.

4.1.27 In the case of birds, as well as birds being protected from killing or injury, it is also an offence to take, damage or destroy a nest that is in use or being built, and to take or destroy eggs. Additional protection applies to specific birds listed in Schedule 1 of the WCA, meaning it is also an offence to intentionally or recklessly disturb these species when: on, or near a nest containing eggs or young; when it is building a nest; or when the nest is active with dependent young.

4.1.28 Water vole, freshwater pearl mussel (*Margaritifera margaritifera*) and invertebrate species are also protected under Schedule 5 of the WCA, making it an offence to intentionally: kill, injure or take them; and possess or control them (alive or dead). It is also an offence to intentionally or recklessly: damage or destroy a structure or place used for shelter or protection; disturb them in a place used for shelter or protection; or obstruct access to a place used for shelter or protection.

4.1.29 White-clawed crayfish (*Austropotamobius pallipes*) are partly protected under the WCA, which makes it an offence to capture this species without a licence and also prohibits trade in this species.

4.1.30 Freshwater and migratory fish and their habitats receive protection under the WCA and under the Salmon and Freshwater Fisheries Act 1975 and Eels (England and Wales) Regulations 2009. These species include Atlantic salmon (*Salmo salar*), bullhead (*Cottus gobio*), lamprey (brook, river and sea) (*Petromyzontiformes*), spined loach (*Cobitis taenia*) and European eel (*Anguilla anguilla*).

⁸ The WCA also protects many species from activities related to their sale, including: selling, offering for sale, possessing or transporting for the purpose of the sale or publishing advertisements to buy or sell a protected species (WCA Section 9 (5)).

- 4.1.31** Badger (*Meles meles*) receive protection under the Protection of Badgers Act 1992. Whereby it would be an offence to: take, injure or kill a badger - or attempt these actions; treat a badger cruelly; interfere with a badger sett; possess or control a live badger; or mark or ring a badger.
- 4.1.32** Other mammal species including rabbit (*Oryctolagus cuniculus*), fox (*Vulpes vulpes*) and hedgehog (*Erinaceus europaeus*) are protected under the Wild Mammals (Protection) Act 1996, which makes it an offence to inflict any unnecessary suffering, including crushing or asphyxiation of a wild mammal.
- 4.1.33** Under the WCA, it is an offence to intentionally uproot any wild plant without the landowner's consent. For the majority of plants, fungi and lichen listed on Schedule 8 of the WCA it is an offence to intentionally pick, uproot or destroy them, unless it could not be reasonably avoided (i.e. it was an incidental result of a lawful action).
- 4.1.34** Some plants are listed on Schedule 5 of the Habitats Regulations. For these species it is an offence to: deliberately pick, collect, cut, uproot or destroy them; or possess, control or transport them (alive or dead).

Species of Conservation Concern

- 4.1.35** Other rare or declining species may not receive strict legal protection but may be recognised on published lists as species of conservation concern that should be protected as a matter of best practice.
- 4.1.36** Under Section 41 of the NERC Act, the Secretary of State must publish a list of the living organisms which in the Secretary of State's opinion are Species of Principal Importance for the purpose of conserving biodiversity. Planning authorities are required to have particular regard to these species and treat them as a material consideration in the planning process. Consideration of species of conservation concern during development projects is a requirement of the NERC Act which states that any '*public authority must, in exercising its functions, have regard... to the purpose of conserving biodiversity*' and '*conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.*'
- 4.1.37** Species of Principal Importance or species listed on Local Biodiversity Action Plans (LBAPs) are henceforth referred to as 'priority species'.
- 4.1.38** Most protected species are also listed as Species of Principal Importance, including:
- Species of amphibian not protected from killing and injury under the WCA but listed as species of principal importance including common toad (*Bufo bufo*);
 - All native reptile species in England;
 - Otter, water vole, hazel dormouse and several species of bat;
 - Many invertebrates, including white-clawed crayfish; and
 - Many species of fish, bird, plant, fungi and lichen.
- 4.1.39** Amber/Red List species are also considered as species of conservation concern, most notably:

- Rare or declining bird species listed as Red or Amber in Birds of Conservation Concern (BOCC) (Stanbury *et al.*, 2021); and
- Rare or declining plant species listed as Near Threatened (NT), Vulnerable (VU), Endangered (EN) or Critically Endangered (CR) under A Vascular Plant Red List for England (Stroh *et al.*, 2014).

Invasive Non-Native Plant Species

4.1.40 Invasive non-native plants are those listed as species of special concern because they have the potential to cause severe problems for native UK plants and the environment.

4.1.41 The relevant legislation on invasive plant species is:

- Schedule 9 of the WCA; and
- Schedule 2 of the Invasive Alien Species (Enforcement and Permitting) Order 2019, which gives effect to EU regulations on the prevention and management of the spread of invasive alien species.

4.1.42 Both make it an offence to '*plant or otherwise cause to grow in the wild*' any plant species listed.

Biodiversity Net Gain

4.1.43 The NERC Act states that any '*public authority must, in exercising its functions, have regard... to the purpose of conserving biodiversity*' and '*conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat*'.

4.1.44 Paragraph 187 of the NPPF states that '*Planning policies and decisions should contribute to and enhance the natural and local environment by: ... d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*'.

4.1.45 Paragraph 193 of the NPPF states that: '*When determining planning applications, local planning authorities should apply the following principles:*

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate'.

4.1.46 The Environment Act 2021 provides a framework to improve and protect the natural environment and is overseen by the Office for Environmental Protection. One of the provisions of the Act is the mandatory requirement for most new developments to provide a 10% net gain in biodiversity. Both onsite and offsite enhancements will need to be maintained for a period of at least 30 years following completion of a development.

5. Recommendations for further survey

5.1.1 No significant changes were recorded in the baseline habitats of the site from the update habitat survey conducted in February 2025 by Thomson, and the habitat conditions remain the same (PMoW Report, Thomson, 2025). The following surveys will not be required for these ecological receptors.

- Habitat - National Vegetation Classification survey
- Birds
- Bat activity surveys
- Invertebrate

5.1.2 Following review of the baseline ES chapters prepared by AECOM, the following actions have been identified:

- Submission of a Construction Ecological Management Strategy (CEMS - biodiversity) to the LPA for approval to ensure that construction of the development does not cause harm to biodiversity or ecology including protected species.
- Submission of a Landscape Ecological Management Plan (LEMP), including long-term design objectives, management responsibilities and maintenance schedules for all wetland and ditch habitats to the LPA for approval. This is to ensure the protection of wildlife and the supporting habitat and to secure opportunities for enhancing the site's nature conservation value, promoting positive conservation status for water vole in the area and to complement achievement of the proposed Biodiversity Net Gain ambition.
- Submission of an Ecological Design Strategy (EDS) to the LPA for approval. The EDS shall ensure that on-site compensatory habitat is provided for relevant protected and priority species (as determined by a suitably qualified ecologist). This will ensure that construction of the development does not cause harm to species including protected species and their habitat.
- As part of the EDS, details of the body or organisation(s) responsible for implementing the EDS and the mechanisms for securing the mitigation/compensation land and its management for the lifetime of the development will require confirmation.

Bats 2025

5.1.3 The veteran elder tree numbered T139 (Thomson tree reference 003), of national importance, will be retained and protected from adverse impacts throughout construction and operation of the site. Should the scope of works change and the tree will be impacted then an updated Ground Level Tree Assessment and three inspections of the suitable features for roosting bats will be required.

5.1.4 Further mitigation may be required following the update surveys.

Reptiles 2025

5.1.5 Updated baseline reptile surveys are currently being conducted by Thomson from March to June 2025. This data will be used to devise a suitable reptile mitigation strategy for Gravesend which may include the translocation of reptiles and installation of reptile fencing in some areas of the

site in order to exclude and potentially translocate individuals, where displacement technique is not suitable. Other small areas required for clearance, e.g. for compounds or welfare units will use a two-staged clearance technique with hand searching to displace reptiles from areas of suitable habitat into neighbouring suitable areas. Clearance works should be undertaken during the period March to October inclusive under suitable weather conditions. Ideally clearance works will target March, September and October in those areas of the site with potential to support nesting birds.

Badgers 2025

- 5.1.6** No setts have been identified at Gravesend. Updated badger surveys on the site and the surrounding 30m buffer areas are recommended three months prior to site clearance works. An update survey is being conducted in May 2025 by Thomson to assess the current status of badger setts on site and identify if any are present and will require mitigation or closure under mitigation license from Natural England.

Water Vole 2025

- 5.1.7** Water vole are known to utilise the ditches within and adjacent to the Gravesend site. Updated baseline 2025 surveys and impact assessment are required to estimate the current population within the ditches at Gravesend, identify whether the local population will be impacted and this data will be used to apply for a CL31 mitigation licence from Natural England in order to allow for the displacement of water vole for the creation of a new headwall and discharging waste water.

6. Opportunities for Enhancement

6.1.1 AECOM have proposed enhancements within the Environmental Statement Chapters. These will be highlighted within the LEMP, under Planning Condition 11. These will include, but are not limited to:

- The reptile mitigation strategy will have eight enhancement features such as log/ brash piles and hibernaculum for the benefit of reptiles and other species.
- Ditch enhancement to be proposed as part of the water vole license which may include scrub clearance, marginal aquatic planting and selective tree removal.
- Two fields in the west of the Gravesend site will be reinstated to grazed pasture suitable to support hornet robberfly. The design has incorporated a series of seasonally wet scrapes, seeded and naturally colonised areas, planted native scrub on site/ along the field boundaries, and the establishment of pony grazing.
- The placement of ruts / depressions on site post construction to benefit invertebrates.
- The creation of wet scrapes.
- The creation of tussocky grassland in the northern field.
- A biodiverse brown roof has been designed on the proposed Gravesend headhouse building, incorporating design principles to benefit invertebrates.
- Excavation of the tunnel will generate a large volume of spoil material. National Grid are in negotiations with a number of suitable partner organisations with the facilities to accept spoil materials through existing consented operations (e.g. RSPB at Cliffe Pools) to enable habitat enhancement of existing wetland sites off-site.
- An aim to achieve 10-15% Biodiversity Net Gain. Enhancement strategies such as the creation of new habitats, maintaining their proposed condition and increasing the condition of retained habitats are continuing to be developed to ensure this target is achieved. This will be confirmed in the final BNG report.

7. References

AECOM 2023a - National Grid Cable Tunnel Replacement Project Environmental Statement Volume VI, Appendix 7.1 Preliminary Ecological Appraisal.

AECOM 2023b - National Grid Cable Tunnel Replacement Project Environmental Statement Volume VI Appendix 7.7 Reptile Survey Report (Revision 1)

AECOM 2023c National Grid Cable Tunnel Replacement Project Environmental Statement Volume IV Chapter 15: Biodiversity - Gravesend

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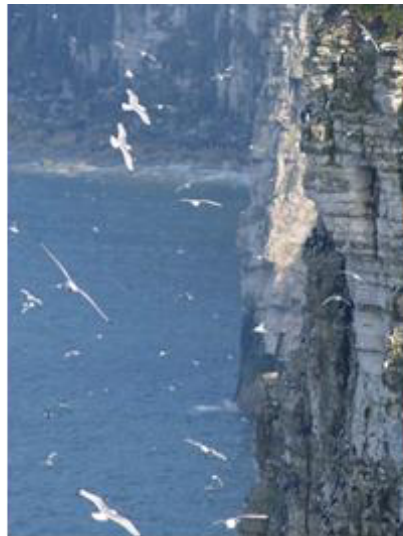
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Thomson 2025 Precautionary Method of Works (PMOW) Grain to Tilbury Tunnel - Gravesend Site. Report Reference: RIV003-001-002/001/001

Appendix B – Reptile Mitigation Strategy



Reptile Mitigation Method Statement

Gravesend

For

Ferrovial BEMO JV

Report Ref.: RIV003-001-003/005/001

July 2025

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RIV003-001-003	005

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001	04/07/2025	Grace Cousins	Mate Vakarcs	Paul Franklin
002	14/07/2025	Grace Cousins	Mate Vakarcs	Paul Franklin

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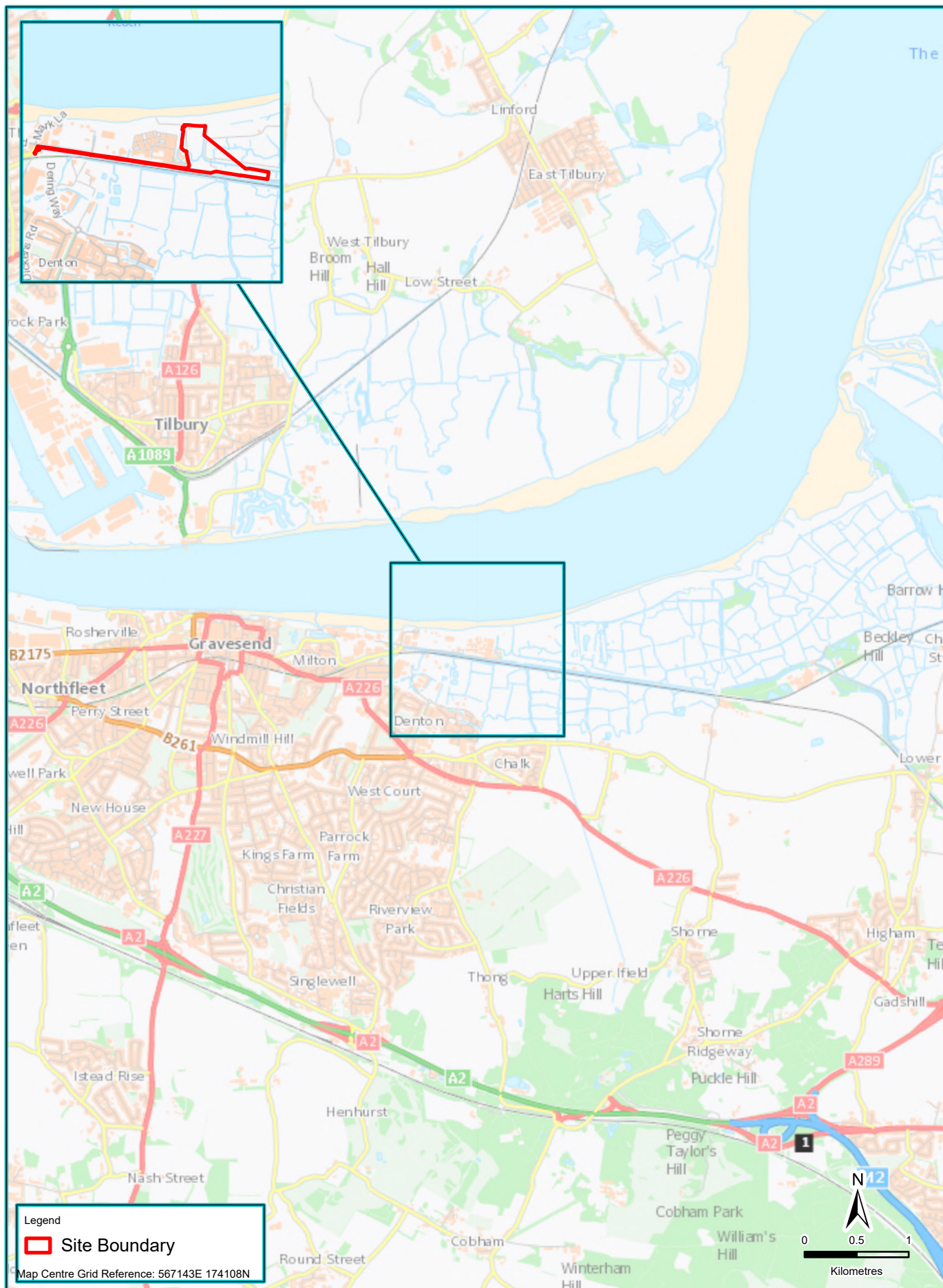
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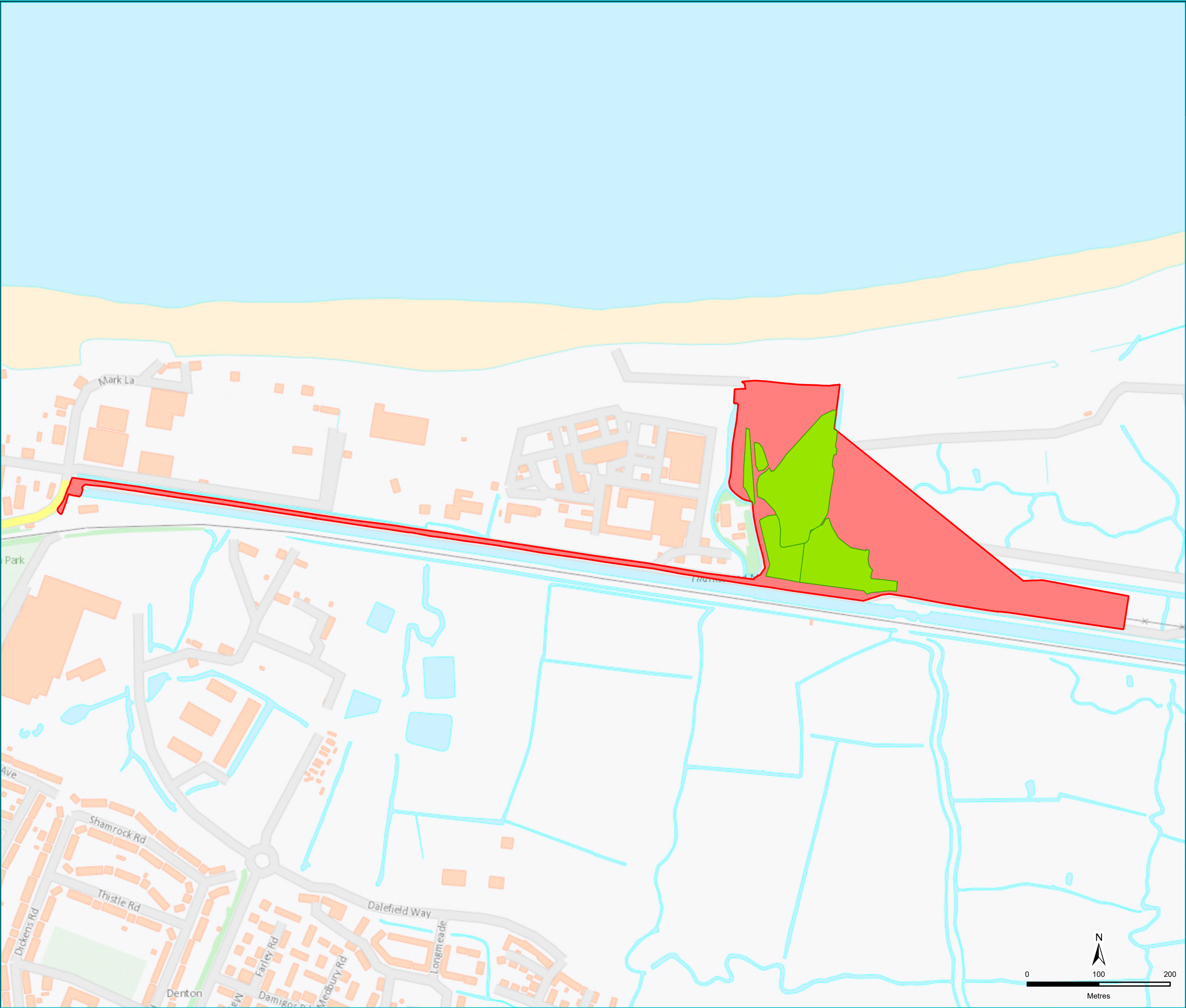
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- Legend
- Reptile Habitat Suitability**
- Good
 - Poor
 - Site Boundary

Map Centre Grid Reference: 567143E 174108N

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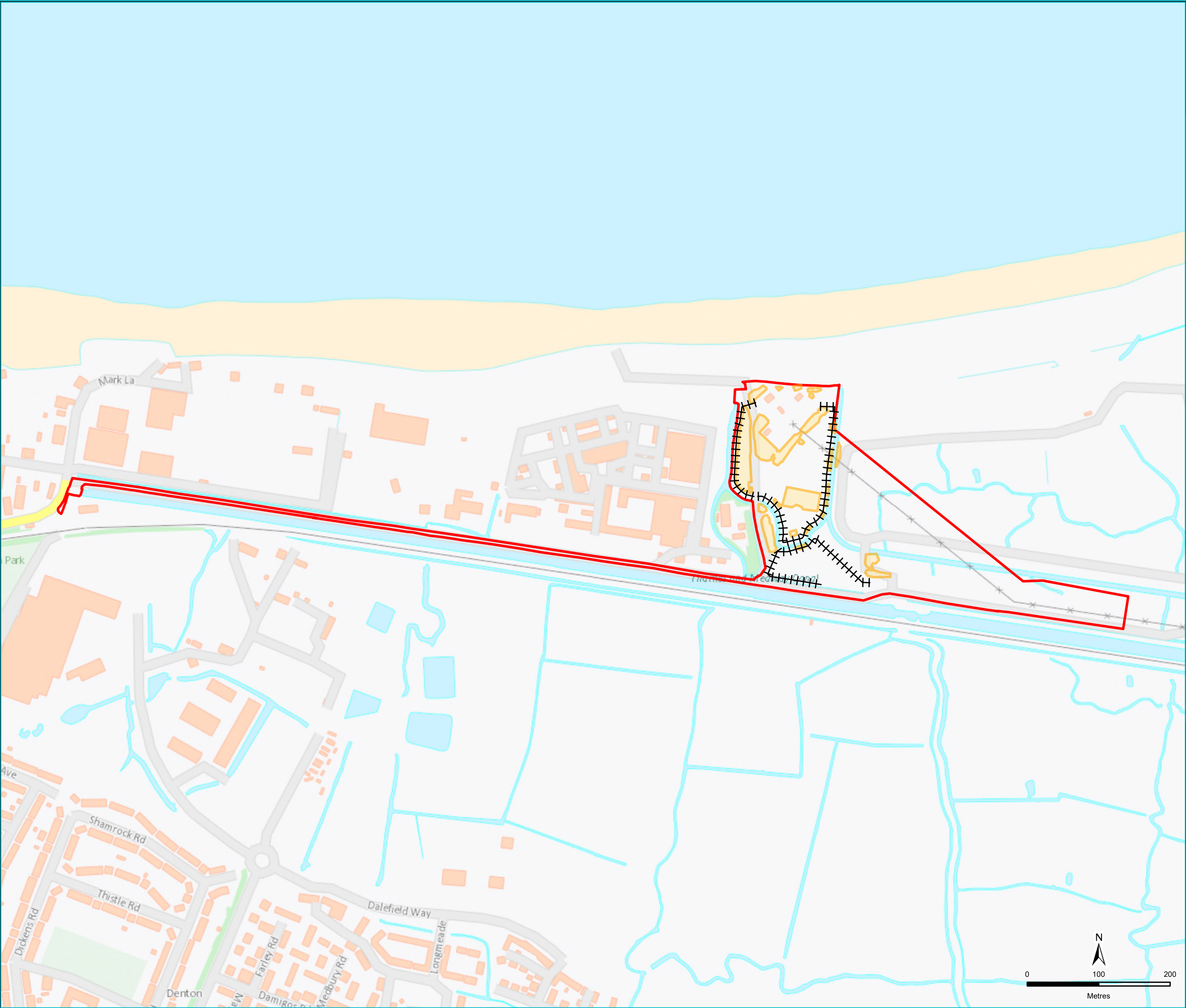
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Client
Ferrovial-BEMO Joint Venture

Figure Number
2

Figure Title
Habitat Suitability
Assessment

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- Legend
- Site Hoarding
 - Areas to be Impacted
 - Site Boundary

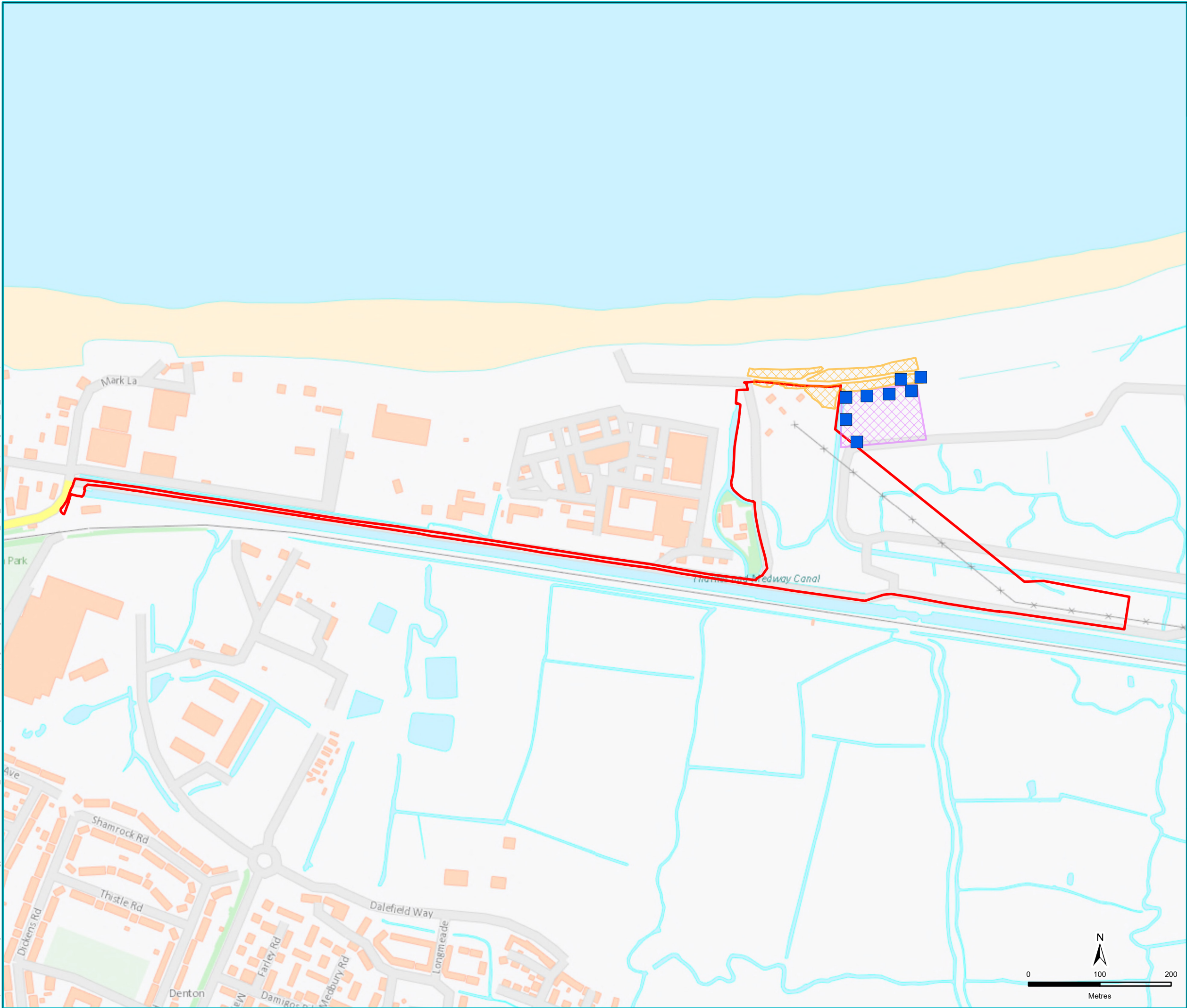
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Ferrovial-BEMO Joint Venture			
Figure Number		3	

Figure Title

Impacts Plan

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- Legend
- Indicative Locations for Log/ Brush Refugia Piles
 - Grassland Management Area to be Enhanced for Reptiles
 - Area to Enhance for Reptiles: By Relaxing Cutting Regime and Installation of Dead Hedging
 - Site Boundary

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Figure Number	
4	

Figure Title

Reptile Mitigation and Enhancement Plan

1. Introduction

1.1 Development Background

- 1.1.1** Gravesend is located in Kent, where Ferrovial BEMO Joint Venture (FBJV), on behalf of the National Grid, are proposing electricity infrastructure upgrades. The proposals will include the construction of a new forced ventilated tunnel shaft underneath the Thames that will house new cable circuits, installation of new cabling, and construction of two headhouses. This will form part of a wider suite of infrastructure upgrades and reinforcements planned by National Grid as part of The Great Grid Upgrade.
- 1.1.2** The development will be located on the Lower Thames Estuary, covering Tilbury to Gravesend with electrical infrastructure upgrades located at two sites, Tilbury in Essex to the north of the River Thames and Gravesend in Kent to the south of the River Thames. This report specifically relates to the Gravesend site only.
- 1.1.3** The following above-ground components of the newly bored tunnel are anticipated, hereafter referred to as the Proposed Development:
- A new cable sealing end compound (SEC): consisting of:
 - A new tunnel headhouse which will cover the shaft into the tunnel;
 - A new overhead line gantry structure which will connect the overhead line downlead conductors and transfer them to six sealing end structures; and
 - Modifications to the existing overhead line (OHL): The new OHL conductors will be connected to the existing TKRE 400kV OHL conductors via new terminal pylons. The old OHL conductors and existing pylons will be either replaced, refurbished or removed.
- 1.1.4** The Proposed Development comprises a permanent footprint of approximately 0.023 hectares (ha) in Gravesend (grid ref approximately TQ 67455 74158) and a temporary footprint of approximately 3.71 ha. It is located within the Canal and Grazing Marsh, Higham Local Wildlife Site (LWS), designated for its grassland habitats and on land owned by National Grid.
- 1.1.5** The reptile mitigation proposed in this method statement is to facilitate vegetation removal across the site in preparation for the set-up of a construction compound, car parking area, installation of bridge over the watercourse and erection of perimeter hoarding around the site in order to secure the site ahead of construction phase.
- ### 1.2 Ecology Background
- 1.2.1** The site has a central strip of amenity grassland which is used as part of a rifle range. Strips of marshy grassland are located to the north of this block of amenity grassland and a large block of scrub vegetation is located in the north-east corner of the Site (AECOM, 2023).
- 1.2.2** The reptile survey report (AECOM, 2023) recorded the following:

- *“the central areas of the three fields to the south of the existing SEC at Gravesend were considered likely unfavourable areas to support reptiles because these habitats were isolated, and the short grassland areas did not provide shelter for reptiles or the elements (e.g. heat, dry weather and wind) or predators).*
- *the smaller areas of habitats such as rough grassland, scrub and ruderal habitats present around the margins of these fields provide areas of more suitable habitat that offer favourable vegetation structure for abundant prey, cover and connectivity with other areas of suitable habitat*
- *Areas of rough grassland, tall ruderals and scattered scrub located adjoining the existing sealing end compound and to the west of the access track adjoining the Metropolitan Police Training Centre also provide good structural diversity suitable for reptiles*
- *The rifle range to the east of the proposed Gravesend SEC supports areas of shorter grassland of limited value for reptiles.*
- *The bunds, surrounding the rifle range and the areas of grassland to the north have greater structural complexity and thus greater suitability to support widespread reptiles.*
- *The habitats with suitable structural complexity at the Gravesend Site described above all provide suitable insolation to be suitable for basking reptiles. The soil bunds within the fields to the south of the proposed new Gravesend SEC and surrounding the rifle range are particularly suitable for basking reptiles.*
- *The areas of habitat identified above as having good structural diversity all offer good availability of suitable refuges. The earth bunds within the fields to the south of the proposed Gravesend SEC and surrounding the rifle range provide optimal areas of potential breeding habitat. These features also provide suitable hibernation habitat”.*

1.2.3 Reptile surveys carried out by AECOM recorded common lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*). Grass snake (*Natrix Helvetica*) was not recorded during the presence/absence survey but they were sighted utilising the ditches during water vole and otter surveys undertaken in 2023. Adders (*Vipera berus*) were not recorded during the presence/absence survey (AECOM 2023). Habitats at the Gravesend Site are suitable to support populations of slow worm, grass snake and common lizard. Gravesend would be considered an ‘important’ Site in relation to reptile biodiversity and population (Froglife, 1999). An update reptile habitat suitability assessment was conducted in 2025 by Thomson Environmental Consultants and the results are shown on Figure 2.

1.2.4 Baseline monitoring surveys for reptiles on site have been conducted in 2023 and repeated in 2025 to determine presence or absence of reptiles and record peak counts of populations. The surveys were carried out each year, between April and September inclusive (AECOM, 2023; Thomson Environmental Consultants, 2025). Reptiles were recorded during every year of monitoring, with three reptile species recorded at the Gravesend site, comprising common

lizard, slow worm, grass snake. A summary of the biology, conservation status and legal protection of reptiles is given in Appendix 1.

1.2.5 A summary of survey results can be found in Table 1. Detailed results from the more recent 2025 survey can be found in Appendix 2.

Table 1: Peak count and populations size of reptiles recorded within Gravesend site:

Species	Survey 2023 (AECOM)	Survey 2025 (Thomson)	Population Size Class Estimate 2025 (Thomson)
Common lizard	1	2	Low
Slow worm	5	10	Moderate
Grass snake	1*	1	Low
* incidental record during water vole survey			

1.2.6 The table above appears a slight increase in reptile population on site, whilst doing a direct comparison of 2023 with 2025 data. However, given the survey constraints listed in the AECOM reptile chapter (AECOM, 2023), it is likely that the lower numbers recorded in 2023 were more likely due to the recorded hot spell of weather conditions and trampling of mats from horses, rather than an actual increase in reptile assemblage. Therefore, it is likely there is no significant variation between the 2023 and 2025 population data for Gravesend site.

2. Legislation and Planning Policy

2.1.1 The reptile species¹ recorded on the site (common lizard, slow worm and grass snakes), are listed under Schedule 5 (Sections 9(1) and 9(5)) of The Wildlife and Countryside Act 1981 (as amended). The legislation protects these animals from:

- Intentional killing and injury (Section 9(1).
- Selling, offering for sale, possessing or transporting for the purpose of the sale or publishing advertisements to buy or sell a protected species (Section 9(5).

2.1.2 Penalties for breaches of legislation are up to £5000, and/or up to 6 months imprisonment per offence.

2.1.3 No derogation² licence is available for these offences. However, there is a defence against prosecution if the act was 'the incidental result of a lawful operation and could not reasonably have been avoided' (Section 10(3)(c) of the Wildlife and Countryside Act 1981 (as amended). Avoidance measures to minimise the risk of killing and injury of reptiles is set out in the following method statement.

2.1.4 The reptile species recorded on site are also listed as Species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006. This places a duty on all government departments, including planning authorities, to have regard for the conservation of these species.

2.1.5 Full details of the legislation and national planning policy that applies to reptile species can be found in Appendix 1.

2.2 Impact of Project on Reptiles

2.2.1 Site clearance as part of the proposed works has the potential to kill and injure reptiles known to be present on the site. Areas proposed for clearance are required for compounds, hoarding installation, bridge installation and access routes for construction traffic and cranes. The areas that will be impacted by site clearance are shown on Figure 3.

2.2.2 The mitigation measures set out in this method statement are required in order to avoid killing and injury of reptiles and enable compliance with relevant legislation.

2.3 The Brief and Objectives

2.3.1 Thomson Environmental Consultants was commissioned in May 2025 by Ferrovial BEMO Joint Venture (hereafter FBJV) to produce a reptile mitigation method statement to detail the

¹ This includes what are sometimes referred to as the 'common' reptile species and excludes the 'rare' reptiles, sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*), which are protected under The Conservation of Habitats and Species Regulations, 2017 (as amended).

² An exemption from or relaxation of a rule of law. Derogation licences, issued by Natural England or Natural Resources Wales, are available for some protected species, including 'rare' reptiles

methodology to be used to prevent killing and injury of reptiles at Gravesend prior to commencement of vegetation and site clearance for the construction phase of the project.

- 2.3.2** The objective of the mitigation method statement is to provide a working methodology for the techniques to be deployed to prevent the killing and injury of reptiles as a result of the proposed works. In the case of accidental killing or injury of reptiles following the implementation of the mitigation, this document could be used as part of a defence with respect to offences under the Wildlife and Countryside Act, 1981, to demonstrate a reasonable effort has been undertaken to avoid the killing or injury of reptiles during the implementation of the project

3. Mitigation Method Statement

3.1 Background

3.1.1 The contents of this section detail the methods used to mitigate impacts to reptiles that are likely to occur during the works. In the absence of mitigation, the following impacts to reptile species are anticipated:

- Temporary loss of suitable habitat (3.71 ha) temporarily lost during the construction phase, and
- Permanent loss of 0.023 ha;
- Killing or injury of individual reptiles during site clearance.

3.1.2 As described in Section 1 the killing and/or injury of reptiles would constitute an offence under the Wildlife and Countryside Act, 1981.

3.1.3 This method statement has been prepared with consideration given to the project description and programme. Mitigation and enhancement measures are shown on Figure 4.

3.2 Avoidance Measures

3.2.1 To avoid killing or injury, reptiles will be displaced or removed from areas of suitable habitat on the site where they have been recorded or are reasonably likely to be present. Reptile displacement and capture can only be undertaken during the reptile active season, between April and September³.

3.2.2 Natural England Guidance (<https://www.gov.uk/guidance/reptiles-advice-for-making-planning-decisions>) suggest that mitigation measures could include: '*displacement by making habitats unsuitable, for example by cutting vegetation in stages during the active season*'. This assumes that an initial cut of the vegetation, using equipment and a cutting height that will not kill or injure reptiles, will create less favourable habitat conditions for reptiles that will persuade them to relocate (displace) into neighbouring areas with a more favourable habitat condition. The effectiveness of this technique is not well documented and is likely to vary between species of reptile.

3.3 Mitigation Approach

3.3.1 The proposed mitigation approach includes a 2-stage habitat clearance and displacement with habitat enhancements to the north and east of the site. A suitable reptile enhancement site has been identified (outside the site boundary itself) to the north east which will not be impacted by

³ During the winter period reptiles are likely to be hibernating underground.

the proposed works. Location of the reptile enhancement area and clearance methodology is detailed below and in Figure 4.

3.4 Reptile Enhancement Sites

3.4.1 An official translocation exercise is not deemed necessary given the small-scale nature of the proposed clearance, numbers of reptile recorded both in 2023 and 2025 and nature of temporary disturbance to habitat. Due to the natural barrier of the watercourse and the need for access/ egress of large construction vehicles (including cranes), reptile fencing is not appropriate at the Gravesend site. However, any individual animals located via finger-tip search or during the displacement two-staged vegetation clearance will be relocated to the designated reptile enhancement site to the north-east boundary of the site, and displaced to the neighbouring RSPB and Environment Agency owned and managed land.

3.4.2 The following factors justify this methodology:

- Common lizard and grass snake populations present on site are classified as “Low”, with the exception of slow worm which was “Moderate”;
- Installation of dead hedging to aid connectivity in the enhancement site.
- Neighbouring landowners (for the EA and RSPB)- owning land parcels to the east and north of the site have also agreed to maintain a less intensive mowing and cutting regime within the reptile enhancement areas order to create a diverse sward height which will benefit common reptile species.
- Management to be implemented in the areas along the flood embankment and within the firing range. This includes a relaxation of the cutting regime within the flood embankment backslope which has previously been short sward. In the area of the firing range it was introducing some shorter sward areas by implementing mowing of some areas to prevent this all being long sward grassland with limited structural diversity to further enhance carrying capacity.
- Eight brash/ log piles will be installed within the reptile enhancement site (indicative locations shown on Figure 4).

3.4.3 The reptile enhancement site contains a mixture of suitable habitats for reptiles, comprising wetland, grassland and scrub habitat, which was assessed during the initial walkover survey by Thomson in February 2025. There is scope to enhance the grassland to further benefit reptiles via cutting and mowing regimes.

3.4.4 The southern field section of site was formerly horse-grazed pasture. Horse grazing was stopped in winter 2024 in order to prepare the site ahead of clearance for development. A mowing regime is in place to maintain a shorter sward to dissuade reptiles into the area prior to clearance for the development and construction compound.

3.4.5 A total of eight log and brash pile refugia; measuring 2x2 x0.5m will be installed within this area (away from the public right of way) and along the perimeter of the site, in order to provide more cover and shelter for reptiles as well as provide hibernation opportunities and increase carrying capacity further in these areas. Indicative refugia locations have been shown on Figure 4.

3.5 Displacement and Fingertip Search

- 3.5.1** In reasonable weather conditions, ensuring there are no other nature conservation issues, such as nesting birds or other protected species, and with reptile enhancement site available, all surface features (e.g. logs, stones and rubbish), and subsurface features (e.g. tree stumps), will be carefully dismantled and removed under the supervision of a suitably experienced ecologist. Any reptiles seen will be captured, where possible, and relocated to the reptile enhancement site. This exercise will be completed during the active reptile season (March to October inclusive).
- 3.5.2** Vegetation will then be cut to no lower than 100mm above ground level using hand tools (including strimmers and mowers), under the supervision of a suitably experienced ecologist. Cut vegetation will be raked and the arisings will be removed from site. Any brash and logs cut from removed vegetation will be used to construct eight refugia log/ brash piles to be installed in the reptile enhancement area.
- 3.5.3** The ecologist will fingertip search the cut area including hand raking to disturb reptiles sheltering in ground vegetation. Holes, soft soil or root balls where reptiles could be sheltering will be sensitively excavated. Any newly exposed refugia (features suitable to support sheltering reptiles) will be dismantled, searched and removed from site. Any reptiles seen will be captured, where possible, and relocated to the reptile enhancement site.
- 3.5.4** The site will be left for a period of at 24 hours to allow reptiles time to move into areas of neighbouring more favourable habitat.
- 3.5.5** If the ecologist, following a further fingertip search of the habitat, considers it unlikely that reptiles remain in the searched area, the vegetation can be removed to ground level, with arisings raked and removed. Reptiles would no longer be considered a constraint in these cleared areas provided the habitat is maintained as unsuitable.

3.6 Reptile Capture during refugia removal / vegetation clearance

- 3.6.1** Artificial reptile refugia has been left deployed following completion of the 2025 reptile surveys at Gravesend. These refugia will be left in-situ to aid the capture of any reptiles from site prior to any proposed vegetation clearance. The refugia will be removed prior to the initial cut. Any natural refugia will also be searched in the same way and dismantled. A cautious approach will be used when checking the artificial refugia, with a check first to see if there are reptiles basking on top of the refugia. If none are seen, then each refugia will be gently lifted to search for reptiles. Any reptiles present will be captured with a cupped hand and held firmly, but not grasped tightly, and not below the vent.
- 3.6.2** Any captured reptiles will be placed in a clean cloth bag (one per bag) which will be securely tied. Cloth bags containing reptiles will be placed in a cool box. Animals will be released preferably at the reptile enhancement site, on the same day and as soon as possible after capture, at a predetermined release point with optimal reptile habitat. Numbers and sex of each species will be recorded by the ECoW.

3.7 Destructive Search and Site Clearance

3.7.1 Two-staged clearance of suitable habitat and subsequent destructive search should be undertaken during the active reptile season (April to October inclusive). This will occur in the highlighted areas shown on Figure 3. Any suitable natural refugia will undergo a destructive fingertip search by an ecologist, with refugia dismantled to facilitate capture of reptiles if present. If reptiles are identified during the search, then these will be translocated and released within the pre-identified reptile enhancement site. Reptiles will be handled and released using the same methods as described above.

3.7.2 If during the destructive search any reptiles are killed or injured; or the consultant ecologist considers it likely that reptiles remain in the area and that avoidance of killing and injury cannot be avoided by fingertip searches alone, additional trapping effort aided by the use of artificial refugia may be required⁴.

3.7.3 The destructive search comprises the following:

- A toolbox talk will be delivered to site operatives prior to works commencing on site and will include information on identifying areas suitable for reptiles, how to identify reptiles and give a summary of their legal protection;
- A two-stage cut undertaken under an ecological watching brief. Vegetation will first be cut to 150 mm using hand tools;
- An ecologist will then destructively finger-tip search habitats to check if reptiles are still present prior to a second cut. A second cut should proceed no more than 24 hours following the first cut to ground level to ensure habitats are no longer suitable for reptiles;
- If any reptiles are identified during clearance, these will be moved to the designated reptile enhancement site, outside of the construction work area.

3.8 Post Construction Mitigation and Habitat Creation

3.8.1 Long-term population monitoring on site and the enhancement site will be required for reptiles. This will commence post-construction (circa 2029) and comprise of seven presence/ absence visits to assess population status of common reptiles present on site and confirm longevity of the eight created refugia piles.

⁴ This could occur where ground conditions are such that cutting of vegetation has not been effective in displacement of reptiles into neighbouring habitat and natural refuges remaining for reptiles are at a density that makes fingertip searching of every potential refuge impractical.

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Appendix 1 - British Reptiles

Introduction

A summary of the biology of British reptiles, the legislation that protects them and other mechanisms of highlighting species of conservation concern is provided below.

Biology

There are six British species of reptiles comprising three snake species, adder (*Vipera berus*), grass snake (*Natrix helvetica*) and smooth snake (*Coronella austriaca*), and three lizard species, common lizard (*Zootoca vivipara*), sand lizard (*Lacerta agilis*) and slow worm (*Anguis fragilis*). In addition, occasional sightings of non-native alien species may occur, arising from escapes or illegal releases. A summary of each native reptile species is given below, based on information provided in Arnold (1995), Beebee and Griffiths (2000) and Gent and Gibson (1998).

Adder

Adders emerge from hibernation from March onwards and bask in open areas, particularly in spring. The mean temperature of a basking adder is about 33°C. Mating occurs every year throughout April and May and the young are born in late August to September. Hibernation commences in October. Adders have a distinctive zig-zag pattern running down the length of their spine. Males are generally white or pale grey with a black zigzag whilst females are a pale brown colour, with a darker brown zigzag. They are a venomous species with small mammals making up the majority of their diet.

The adder has a widespread but patchy distribution in Britain and is more abundant in the south than the north. Nevertheless, species records exist for northern Scotland. They require undisturbed, open sunny areas in proximity to thick cover. South-facing slopes with a mosaic of bare ground, bracken, tall heath and rocky outcrops may be ideal, although heathland, moorland, coarse grassland and scrub may also suffice.

Grass snake

The grass snake is the largest snake in Britain and is easily identifiable by its green/olive body, dark streaks on the flanks and a distinct yellow and black collar behind the head. They emerge from hibernation in March and, during spring in particular, bask in open areas in order to raise their body temperature. Active grass snakes maintain temperatures of between 26 and 30°C. Eggs are laid in June and July with the young hatching in September. Their main food items are amphibians and fish, which they hunt in both terrestrial and aquatic environments.

Grass snakes have a lowland distribution in Britain and are absent from Scotland. They are widespread and locally common in the south-east of England. The grass snake is essentially an aquatic species, occurring mainly where there are healthy populations of amphibians. Open areas with direct sunshine in proximity to dense cover are also important, as are suitable egg laying sites, such as compost or manure heaps.

Common lizard

The common lizard is the smaller of the two British lizards with the typical legged body form. Common lizards typically emerge from hibernation from March onwards, but earlier emergence can occur during exceptionally warm and sunny conditions. Common lizards bask in open sunny areas and try to achieve an optimum operating temperature of around 30°C. The young are born from mid-July to mid-September and hibernation commences in October. The main food items of this species are invertebrates.

Common lizards have a widespread distribution across England, Wales and Scotland and are also native to Ireland. They prefer undisturbed ground, with dense but short vegetation and patches of bare ground or promontories that are fully exposed to the sun. South facing slopes are often favoured. They are found in a variety of open habitats including roadside verges, railway embankments, woodland clearings, rough grassland, scrub, heathland and coastal sand dunes.

Slow worm

The slow worm is a legless lizard that superficially resembles a snake. Slow worms emerge from hibernation from March onwards. When active, slow worms rarely bask in open areas and instead try to maintain a body temperature between 14.5 and 28°C, mainly by contact with warm surfaces. The young are born from mid-August to mid-September and hibernation commences in October. The main food items of this species are invertebrates.

Slow worms have a widespread distribution across England, Wales and Scotland, but are particularly common in southern and eastern England. They require fairly thick vegetation interspersed with sunny areas for thermoregulation and underground or covered refuges. They are found in a wide variety of habitats including rough grassland, heathland, moorland, downland, hedgerows, scrub and woodland edge. Good populations can sometimes be found on railway embankments, motorway verges and allotments.

Site Designation

The most important sites for reptiles in the UK receive statutory protection under the following legislation:

- Wildlife and Countryside Act 1981, as amended;
- The Countryside and Rights of Way Act 2000 (which amends the Wildlife and Countryside Act); and
- Natural Environment and Rural Communities Act 2006 (which amends the Wildlife and Countryside Act).

Sites designated under the Wildlife and Countryside Act 1981 (WCA) are known as Sites of Special Scientific Interest (SSSIs). SSSIs received further protection under the Countryside and

Rights of Way Act 2000 (CRoW) and the Natural Environment and Rural Communities (NERC) Act 2006.

Some SSSIs are designated for the populations of reptiles that they support. The criteria for selecting SSSIs on the basis of their reptile populations are provided in Guidelines for the Selection of Biological SSSIs (NCC, 1989):

- Sand Lizard - all important and established populations in Dorset and all established populations elsewhere;
- Smooth snake - all important and established populations in Dorset and all established populations elsewhere;
- Other reptiles - best locality in a given area with outstanding assemblages of at least 3 species of the 4 other reptile species.

Sites that qualify as SSSIs are considered to be of at least national importance for the reptiles they support.

Sites designated for nature conservation at the county level may also include reptile populations as part of the site qualifying criteria, although the criteria used may vary from county to county. Such sites are protected through the planning system and there is generally a presumption against development that affects such sites in local authority development plans.

Planning Policy

The National Planning Policy Framework (NPPF) 2024 gives further direction with respect to biodiversity conservation and land use change / development. The NPPF encourages local planning authorities to identify, conserve and restore, ecological networks, which should benefit amphibians, and it also states that planning permission should be refused if significant harm to biodiversity cannot be avoided, mitigated or compensated. In addition, the Government Circular 06/05, which relates to biodiversity conservation, states that all protected species, such as reptiles, are a material consideration for the planning authority when considering proposed developments.

Species Protection

Legislation

Both within and outside designated sites, individual smooth snakes and sand lizards are fully protected by law under the Conservation of Habitats and Species Regulations 2017 as amended (which replaces the Conservation (Habitats &c) Regulations 1994). The Regulations make it an offence, with very few exceptions, to:

- Deliberately capture, injure or kill a smooth snake or sand lizard;
- Deliberately disturb a smooth snake or sand lizard in such a way as to be likely:
 - i. to impair its ability to survive, to breed or reproduce, or to rear or nurture its young; or

- ii. to impair its ability to hibernate or migrate; or
 - iii. to affect significantly the local distribution or abundance of the species to which they belong.
- Damage or destroy a breeding site or resting place of a smooth snake or sand lizard;
 - Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead smooth snake or sand lizard, or any part of, or anything derived from a smooth snake or sand lizard.

In addition to the protection given to smooth snake and sand lizard under Conservation of Habitats and Species Regulations 2017 as amended already described, smooth snake and sand lizard are also partially protected in England under the Wildlife and Countryside Act, which adds the following offences (with certain exceptions):

- Disturbance while it is occupying a structure or place which it uses for shelter or protection; or
- Obstructing access to any structure or place used for shelter or protection.

If proposed work has the potential to kill, injury or disturb either of these species, or damage their habitats, appropriate mitigation which seeks to avoid these impacts should be devised and implemented under licence from Natural England.

Grass snake, common lizard, slow worm and adder also receive some protection under the WCA but are protected from intentional killing, injuring and selling only. If proposed work has the potential to kill or injure grass snake, common lizard, slow worm or adder, appropriate mitigation should be devised and implemented with agreement from the local planning authority or Natural England. However, mitigation for these species is not subject to licensing by Natural England.

UK Post-2010 Biodiversity Framework and Species of Principal Importance

Published by the Joint Nature Conservation Committee (JNCC) and the Department for Environment, Food and Rural Affairs (Defra) in July 2012, the UK Post-2010 Biodiversity Framework identifies UK-scale activities and priority works that are required to deliver the EU Biodiversity Strategy. Following a process of devolution, the framework is underpinned by country level strategies which are now largely responsible for continuing the work carried out under the former UK Biodiversity Action Plans (UK BAP). JNCC guidance dictates that UK BAP background information on priority species and habitats still remains relevant and it now forms the basis of country specific priority lists, which for England, are specified under Section 41 of the NERC Act 2006. Targets for England's biodiversity strategy 'Biodiversity 2020': A strategy for England's wildlife and ecosystem services, are informed by this list.

British reptiles are one such group that have been adopted as Species of Principal Importance for the Conservation of Biodiversity in England. This places a duty on all government departments to have regard for the conservation of these species and on the Secretary of State to further, or promote others to further, the conservation of these species. Furthermore, the NPPF states that local planning authorities should promote the protection and recovery of priority species populations linked to national and local targets, which presumably means those

listed under the Section 41 of the NERC Act, the former UK BAP and on Local or Regional priorities species lists.

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Appendix 2 - Reptile Monitoring Results

Gravesend

Date	Species	Total peak adult count	Adult Male	Adult Female	Adult (Unknown)	Juvenile
28/04/25	Slow worm	8	2	5	-	3
	Common lizard	1	-	-	-	1
02/05/25	Slow worm	5	-	5	-	-
	Grass snake	1	1	-	-	-
06/05/25	Slow worm	9	3	6	-	4
	Grass snake	-	-	-	-	1
09/05/25	Slow worm	6	3	3	-	-
12/05/25	Slow worm	4	3	1	-	-
	Grass snake	1	-	-	1	-
15/05/25	Slow worm	4	1	3	-	-
	Grass snake	-	-	-	-	1
19/05/25	Slow worm	10	4	6	-	-
	Common lizard	2	2	-	-	-

Date	Species	Total peak adult count	Adult Male	Adult Female	Adult (Unknown)	Juvenile
	Grass snake	1	1	-	-	-