

Riverside Energy Park

Outline Biodiversity Landscape Mitigation Strategy

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Executive Summary

Peter Brett Associates (PBA) was commissioned by Cory Environmental Holdings Limited (trading as Cory Riverside Energy (Cory or the Applicant)) to produce an Outline Biodiversity and Landscape Mitigation Strategy (OBLMS) for Riverside Energy Park (REP), an integrated Energy Recovery Facility (ERF). This OBLMS is provided as part of the REP DCO Application.

The purpose of this OBLMS is to capture the key principles required to avoid, mitigate and compensate for effects to terrestrial biodiversity from pre-construction, construction, operation and maintenance of REP.

Outline measures to avoid, mitigate or compensate for effects to biodiversity receptors within the REP site, Main Temporary Construction Compound, Electrical Connection route, and Cable Route Temporary Construction Compounds are set out within Sections 2 and 3 of the OBLMS.

Details of biodiversity offsetting measures being used to compensate for loss of habitats are provided within **Section 5**. These will be delivered through a financial contribution to the Environment Bank with a legal agreement for contribution towards enhancement of habitats outside the Application Boundary.

DCO Requirement 5 sets out the need to secure a final Biodiversity & Landscape Mitigation Strategy (final BLMS) which will be substantially in accordance with the OBLMS (this document).

1 Introduction

1.1 Overview

1.1.1 Peter Brett Associates (PBA) was commissioned by Cory Environmental Holdings Limited (trading as Cory Riverside Energy (Cory or the Applicant)) to produce an Outline Biodiversity and Landscape Mitigation Strategy (OBLMS) for Riverside Energy Park (REP), an integrated Energy Recovery Facility (ERF).

1.1.2 This OBLMS will be submitted as part of the Development Consent Order (DCO) for REP. **Requirements 4 and 5 of Draft DCO (dDCO) (3.1, Rev 2)** set out the need to secure a final Biodiversity & Landscape Mitigation Strategy (final BLMS) covering both the pre-commencement works and construction and operation phases, which will be substantially in accordance with the OBLMS.

1.2 Project Background

Site Location and Description

1.2.1 REP would be located within the administrative areas of the London Borough of Bexley (LBB) and Dartford Borough Council (DBC). The site extents are shown on **Figure 1.1, Site Location Plan**, and **Figure 1.2, Application Boundary and Assessment Areas** of the **Environmental Statement (ES) (6.2, APP-056)**.

1.2.2 The REP site would comprise the following:

- the REP site itself, located to the north of Belvedere off Norman Road;
- the Main Temporary Construction Compound located to the south of the REP site and west of Norman Road;
- the Electrical Connection Route, running predominantly underground between the REP site and the Electrical Connection Point at Littlebrook substation connecting into an existing National Grid building in Dartford; and,
- Cable Route Temporary Construction Compounds required to support the construction of the selected Electrical Connection route. These will be small discrete compounds, required for a temporary period of time whilst works are undertaken along particular lengths of the Electrical Connection route.

Proposed Development

1.2.3 The primary components of REP are:

- **Energy Recovery Facility (ERF):** to provide thermal treatment of Commercial and Industrial (C&I) residual waste (post-recycling) with the potential for treatment of municipal solid waste (MSW);
- **Anaerobic Digestion facility:** to process food and green waste. Outputs from the Anaerobic Digestion facility would be transferred off-site for use in the agricultural sector as fertiliser or as an alternative, where necessary, used as a fuel in the ERF to generate electricity;
- **Solar Photovoltaic Installation:** to generate electricity. Installed across a wide extent of the roof of the Main REP Building;
- **Battery Storage:** to supply additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the Main REP building; and
- **On Site Combined Heat and Power (CHP) Infrastructure:** to provide an opportunity for local district heating for nearby residential developments and businesses. REP would be CHP Enabled with necessary on-site infrastructure included within the REP site.

Electrical Connection

- **The Electrical Connection route:** REP would be connected to the electricity distribution network via a new 132 kilovolt (kV) underground electricity cable connection. The route options for the Electrical Connection are shown in the **Works Plans (2.2, Rev 1 REP2-004)**.

1.2.4 In consultation with UK Power Networks ('UKPN'), Cory is considering Electrical Connection route options to connect to the existing National Grid Littlebrook substation located south east of the REP site, in Dartford. The route options are located within the LBB and Dartford Borough, and would run from a new substation proposed to be constructed within the REP site.

Scheme Design Evolution

1.2.5 In line with the NPS EN-1, the NPPF, and regional and local planning policy, the design has sought to incorporate the mitigation hierarchy to avoid, mitigate and, as a last resort, compensate for impacts to biodiversity receptors. This has included seeking alternative options where impacts to biodiversity cannot be avoided.

1.2.6 The Applicant is committed to continue to explore options for the Electrical Connection with UK Power Networks (UKPN) to further minimise environmental effects, where practical. This commitment is already demonstrated through the detailed update on the status of the Electrical Connection, as provided in the **Electrical Connection Progress Report (8.02.07, REP2-058)** comprising part of the submission for Deadline 2. This reports that the Electrical Connection has now been refined to a single overall route corridor from the REP site to the Electrical Connection Point at the

Littlebrook substation. This refinement is reflected in updated submissions of the **Works Plans (2.2, REP2-004)**, **Land Plans (2.1, REP2-003)**, **Access and Public Rights of Way Plans (2.3, REP2-005)**, **Book of Reference (4.3, REP2-010)**, **Statement of Reasons (4.1, REP2-008)** submitted at Deadline 2 and the **dDCO (3.1, Rev 2)** submitted at Deadline 3. This demonstrates the work that the Applicant, and UKPN, have done to minimise ecological effects so far.

1.2.7 In addition, at Deadline 2 the Applicant has moved a significant proportion of the Main Temporary Construction Compound from its original location northwards to land owned by the Cory group and which has planning permission for a data centre. This has only just become an option following a change in the delivery programme of the data centre. The sections below have been updated accordingly.

1.2.8 Despite the Main Temporary Construction Compound resulting in only a temporary impact, the Applicant commits in this document to treating any habitat loss on the area of the Main Temporary Construction Compound as a permanent loss, and providing off-site compensation accordingly. This is despite the fact that the area on which the Main Temporary Construction Compound is located has planning permission for data centres and post use as a temporary construction compound, will be governed by a separate planning permission. This is an additional commitment over and above the 10% biodiversity net gain discussed in **Section 1.3** below.

1.3 Ecological Background and Scope of Assessment

1.3.1 At the time of submission of the REP DCO, detailed design information is still evolving and therefore detailed information on construction methodology and programme is currently unknown. This OBLMS sets out the proposed measures to address impacts to biodiversity receptors from the construction, operation, maintenance and decommissioning of REP identified within the REP Environmental Impact Assessment (EIA). These will be fully developed within the final BLMS once final details of construction methodology are known.

1.3.2 The principles of the mitigation hierarchy¹ have been adopted and used when developing measures to address impacts on biodiversity receptors. The principles of the mitigation hierarchy are that in order of preference impacts on biodiversity should be subject to:

- Avoidance;
- Mitigation; and
- Compensation.

¹CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Section 6. Chartered Institute of Ecology and Environmental Management, Winchester.

- 1.3.3 In addition, to ensure the Proposed Development meets requirements within current planning policy in relation to delivery of biodiversity net gain, the Applicant commits to delivering a minimum of 10% biodiversity net gain.
- 1.3.4 This Outline BLMS is provided as part of the REP DCO Application. It should be read in conjunction with the Outline Code of Construction Practice (CoCP) (**7.5, Rev 2**) which sets out principles and requirements relating to the management and mitigation of construction impacts to other environmental receptors from REP and the Electrical Connection.

1.4 Approach

- 1.4.1 All pre-construction, construction and post construction activities associated with REP would be carried out in accordance with the final BLMS, CoCP and the requirements of the DCO.
- 1.4.2 The ecological baseline and identification of significant effects associated with the Proposed Development are set out in full within the REP ES Chapter 11 Terrestrial Biodiversity. This OBLMS should be read in conjunction with the ES.
- 1.4.3 The purpose of this OBLMS is to capture the key principles required to avoid, mitigate and compensate for effects on terrestrial biodiversity from pre-construction, construction, operation and maintenance of REP. The OBLMS has been split between:
- Measures applicable to the REP site and the Main Temporary Construction Compound; and
 - those applicable to the Electrical Connection route.
- 1.4.4 Where works occur within the Kent County Council administrative boundary and the Dartford Borough Council administrative boundary, the Applicant will consult with them in respect of the final BLMS relevant to works in their respective areas. Furthermore, the final BLMS that relates to works in Dartford Borough Council, will be issued to Dartford as the approving authority under **Requirement 5 of the dDCO (3.1, Rev 2)**.
- 1.4.5 The general mitigation measures described in **Section 4** of this OBLMS set out principles which are applicable to addressing effects across the whole of, or a large part of, the Proposed Development. These measures are generally applicable to a number of the biodiversity receptors where adverse effects have been identified.

2 The REP site and Main Temporary Construction Compound

2.1 Pre-construction and Construction

2.1.1 Outline measures to avoid, mitigate or compensate for effects to biodiversity receptors within the REP site, Main Temporary Construction Compound during the pre-construction and construction phases are set out in **Table 1** below.

Table 1: Outline pre-construction and construction phase mitigation measures for the REP site and Main Temporary Construction Compound

Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
Crossness Local Nature Reserve (LNR) ² , Erith Marshes Site of Importance for Nature Conservation (SINC), Belvedere Dykes SINC, and River Thames and Tidal Tributaries SINC.	Protection and appropriate working measures will be required during construction and decommissioning to protect the habitats and species within these nearby designated areas from direct adverse effects.	Consideration of noise, lighting, and pollutant impacts as a result of spillages or leaks from equipment during construction (see Section 4). Fencing of working areas to demark extent of construction activities and reduce risk of accidental damage during construction (see Section 4). Silt fencing to be installed between construction activities and designated area where risk of pollution to ditches is present.	Pre-construction and construction period
Habitats	To avoid, minimise or	Careful consideration has been given to	Financial contribution to be

² The Thames Water managed Crossness LNR will no longer be directly affected due to changes in Application Site boundary submitted at Deadline 2, as described in 1.2.6 above.

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Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
	<p>compensate for impacts through habitat loss within the REP site.</p>	<p>avoidance and mitigation of effects from REP. The loss of open mosaic habitat on previously developed land will be partially compensated within the REP site through creation of the same habitat type on the flood bank between the ERF building and the River Thames (see Illustrative Site Layout Plan (2.4-APP-010), Illustrative Elevation Plans (2.5, APP-011-012) and Illustrative Circulation Plan (2.6-APP-012). However, it is acknowledged that given the nature of the Proposed Development it is not possible to completely avoid, mitigate or compensate for impacts on habitats within the REP site and Main Temporary Construction Compound. Where avoidance, mitigation or compensation do not achieve net biodiversity gain, enhancement of habitats outside the Application Boundary through a financial contribution to the Environment Bank will be set out in a legal agreement and off-site habitats implemented on a</p>	<p>made upon commencement of the DCO and as per the legal agreement – the off-site biodiversity enhancements will be implemented on a phased basis during construction.</p>

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Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
		phased basis. This is set out further in Section 5 below.	
Habitats	To avoid or minimise impacts to habitats from pollution within the REP site.	Construction to be undertaken in line with pollution prevention guidelines and CIRIA ³ guidelines (see Section 4.4).	Prior to and during construction period
Hard and soft landscaping	To provide enjoyable space for people working at REP and RRRF to view and use, with awareness of the construction phase and the long term	Where present, existing hard and soft landscaping that requires removal as part of the development will be replaced by new proposed hard and soft landscaping scheme on site. This will be sympathetically integrated into the existing RRRF landscape masterplan with the use of native and indigenous shrubs with wildflower grasses providing an informal planting style suitable for the surrounding river and nature reserve areas but set out in a designed and legible way that provides an enjoyable space for people working at REP and RRRF to view and use.	Entire construction period
Trees	To ensure no damage to trees.	Whilst there are no woodland areas within the REP site, measures to protect trees within and immediately adjacent to	Prior to and during construction period

³ Construction Industry Research and Information Association

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Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
		the Application Site boundary would be undertaken in line with BS5837:2012 Trees in relation to design, demolition and construction.	
Bats	To avoid/minimise impacts to foraging and commuting bats	Core construction hours are to be 7am-7pm Monday-Friday and 7am-1pm Saturdays. Construction lighting would therefore not affect bats which are unlikely to be active during this time. However, some discrete operations may need to be undertaken outside this period. To avoid impacts to bats during these operations, retained habitats such as scrub and ditch systems around the margins of the REP site and Main Temporary Construction Compound would not be lit. Any required lighting (e.g. lighting required for safety purposes) would be directed to avoid light spill onto retained habitats with after-dark lighting during the main period when bats are active (April to October) being minimised as far as practicable.	Entire construction period
Breeding birds	To avoid/minimise impacts to breeding birds	Where possible, vegetation clearance would be minimised and undertaken	Prior to and throughout construction period.

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Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
		<p>outside the core bird nesting season (1st March and 31st August, though it should be noted that variation in dates is possible, for example from geographical variations in climate, or due to a particularly mild winter) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season would require an inspection of vegetation to be cleared for breeding birds and their occupied nests by a suitably qualified ecologist no more than 24 hours prior to any works being undertaken. If any nesting birds are identified during the survey, they would be left in situ for their entire nesting period and alternative approaches to the work proposed. This may include leaving an exclusion zone around the nests to avoid disturbance.</p> <p>Prior to construction the barn owl box within the REP site will be inspected by a licenced barn owl surveyor and relocated to a suitable location nearby</p>	<p>Breeding bird season defined as March – August inclusive (including potential allowance for seasonal variation)</p>

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Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
		<p>where it will not be subject to construction disturbance. If evidence of barn owl is recorded, the box will be relocated outside of breeding season.</p> <p>Measures to avoid or mitigate impacts to breeding birds, in particular the specially protected Cetti's warbler, during construction from noise/visual disturbance, dust and other pollutants. This could include the use of screens to provide a physical barrier in key locations, along with good site construction practice.</p>	
Reptiles	To avoid/minimise impacts to reptiles	Displacement of reptiles from areas of suitable habitat that would be lost or subject to significant disturbance during development. To be undertaken under a detailed method statement, which will detail methods of site clearance to ensure impacts to reptiles are avoided.	Prior to and during construction period
Terrestrial Invertebrates	To provide alternative habitats for terrestrial invertebrates	In addition to the off-site biodiversity enhancements mentioned in the Habitats section above, approximately 25% of the grassland on the flood bank would be converted to open mosaic	Entire construction period

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Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
		<p>habitat to compensate for the loss of this habitat type within the REP site, and to provide a diversity of habitats of value to invertebrates.</p> <p>The existing upright sleepers and wooden seating units from the main REP site would be recycled and moved to alternative locations within the REP site. These would be enhanced to provide nesting sites for cavity nesting bees and wasps by drilling assorted diameter (2-10 mm) holes in them.</p> <p>As an enhancement measure, two-three simple sandbanks created out of compressed fine grade sand or soil (not hardcore) would be installed at suitable locations within the REP site to create suitable nesting sites for bees and wasps.</p>	
Water Voles	To avoid impacts to water voles.	Impacts to water voles in ditches adjacent to the REP site and Main Construction Compound would be avoided by ensuring an offset of at least 5 m from the top of ditch bank, in accordance with standard guidance (The Mammal Society, 2016).	Prior to and during construction.

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Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
		<p>If this is not possible, impacts to water voles are likely to be mitigated through trapping and temporarily relocating any water voles present to a suitable receptor site. Either within the Order Limits or within a specialist off-site facility. The water voles would be relocated to the original ditches following construction. This would be undertaken under a conservation licence obtained from Natural England.</p>	
Wintering birds	To avoid/minimise impacts to overwintering birds	<p>Construction activities that have a greater likelihood of causing disturbance such as pile-driving would be planned to avoid high tides during the period September to March when passage and overwintering birds are present. Where this cannot be achieved, works would be planned to minimise the potential risk of disturbance; e.g. by minimising duration or via the use of screening such as hoarding.</p>	Entire construction period
Invasive species	To facilitate appropriate invasive species control (giant hogweed and three-cornered	<p>The following measures would be employed prior to and during the construction phase:</p>	Prior to and during construction period

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Receptor	Objectives	Avoidance, Mitigation and Enhancement	Timing
	garlic)	<ul style="list-style-type: none"> ■ Invasive plant species to be resurveyed to map current location and distribution within the site to inform subsequent control; ■ Invasive plants to be treated during the correct season by a licenced contractor to eradicate from site where practical; and ■ Until such a time that the plants have been removed from site, they will be fenced during construction work to ensure separation from construction activities to avoid spread. <p>N.B. it should be noted when treating invasive plants, that giant hogweed poses a risk to human health through phytotoxic sap which can burn skin.</p>	

2.2 Operation

2.2.1 Measures to avoid, mitigate or compensate for impacts to biodiversity receptors within the main REP site and the Main Temporary Construction Compound during the operation phase are set out in **Table 2** below.

Table 2: Outline operational phase mitigation measures for the REP site and Main Temporary Construction Compound.

Receptor	Objective	Mitigation	Timing
Crossness LNR, Erith Marshes SINC, Belvedere Dykes SINC, and River Thames and Tidal Tributaries SINC	To avoid/minimise impact to the designated areas.	Mitigation measures for lighting are set out in the Outline Lighting Strategy (see Section 4). Mitigation measures for surface water treatment would be managed through a system as set out in ' Drainage Design Strategy (February 2018) (5.2, APP-033) ' prepared by Doran Consulting Limited on behalf of Hitachi Zosen Inova.	Ongoing
Habitats	Enhancement of retained/created habitats within REP site.	Retained habitats of ecological value within the REP site, such as the pond east of Riverside Resource Recovery Facility (RRRF) and semi-improved grassland, along with any created habitats are to be managed to enhance biodiversity function.	Ongoing
Bats	To avoid / minimise impacts to foraging or commuting bats.	The strategy for lighting of the REP site is set out in Appendix K.3 Outline Lighting Strategy of the ES (6.3, APP-096) . As set out in the strategy, retained habitats such as scrub and ditch systems around the margins of the REP site would not be lit. Any adjacent lighting (e.g. lighting required for safety purposes) would be directed to avoid light spill onto retained habitats around the	Ongoing

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Receptor	Objective	Mitigation	Timing
		margins of the REP site with after-dark lighting during the main period when bats are active (April to October) being minimised as far as is practicable.	
Breeding birds	To enhance the area for breeding birds.	Options for enhancement that will be considered include: <ul style="list-style-type: none"> ■ The provision of nest boxes for species such as black redstarts that may use the local area for breeding on occasion; ■ The provision of unmanaged corners of the REP site with native self-seeded vegetation to provide a food source for species such as linnet; and ■ The provision of a nesting platform for peregrine on the new building. 	Operation
Reptiles	To enhance the area for reptiles.	Enhancement of suitable retained reptile habitat within the REP site; i.e. to the east of RRRF, and areas to be temporarily affected by works including fields adjacent to Norman Road. To include the creation of artificial hibernacula, basking sites and other features of value for reptiles.	Operation
Soft landscaping	Appropriate plant species that are native and suitable for a riverside location.	The proposed soft landscaping scheme on site will be sympathetically integrated into the existing RRRF landscape masterplan with the use of native and indigenous shrubs with wildflower grasses providing an	Operation

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Receptor	Objective	Mitigation	Timing
		informal style planting suitable for the surrounding river and nature reserve areas.	

3 Electrical Connection Route and Cable Route Temporary Construction Compounds

3.1 Pre-construction and Construction

3.1.1 Measures to avoid, mitigate or compensate for impacts to ecological receptors within the Electrical Connection Route during the construction phase are set out in **Table 3** below.

Table 3: Outline pre-construction and construction phase mitigation measures for the Electrical Connection Route and Cable Route Temporary Construction Compounds

Receptor	Objective	Mitigation	Timing
Crossness LNR ⁴ , Erith Marshes SINC, Belvedere Dykes SINC, River Cray SINC, and Dartford Marshes Local Wildlife Site (LWS).	Protection and appropriate working measures will be required during construction and decommissioning to protect the habitats and species within these designated areas from adverse effects.	Consideration of noise, lighting, and pollutant impacts as a result of spillages or leaks from equipment during construction (see Section 4). Fencing of working areas to demark extent of construction activities and reduce risk of noise and visual disturbance (see Section 4). Silt fencing to be installed between construction activities and designated area where risk of pollution linkage to ditches is present.	Prior to and during construction.
Habitats	To avoid, minimise or compensate for	Temporary construction compounds to be located on areas of hardstanding away from habitats of ecological value	During construction phase.

⁴The Thames Water managed Crossness LNR will no longer be directly affected due to changes in Application Site boundary submitted at Deadline 2, as described in 1.2.6 above.

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Receptor	Objective	Mitigation	Timing
	impacts to habitats of ecological value within the Electrical Connection Route.	where possible. Working areas within habitats of ecological value to be minimised as far as possible and fenced to avoid construction activities encroaching on adjacent areas. Construction to be undertaken in line with pollution prevention guidelines and CIRIA guidelines (see Section 4)	
Hard and soft landscaping	To avoid, minimise or compensate for impacts to hard and soft landscaping	Existing hard and soft landscaping including footways, and planting beds, that need to be taken up / removed as part of the construction works of the Electrical Connection will be 'made good' following the works in accordance with construction best practice. Any planting that is disturbed will be replaced with similar sized replacement planting of the same species as far as possible, or alternative equivalent mitigation landscape works in the vicinity as agreed with the Local Authority.	Entire construction period
Trees	To avoid impacts to trees	Measures to protect trees within and immediately adjacent to the Application Site boundary would be undertaken in line with BS5837:2012 Trees in relation to design, demolition and construction.	Prior to and during construction.
Bats	To avoid/minimise impacts to foraging or commuting bats	Habitats of value to foraging or commuting bats such as woodland, scrub and ditch systems would not be lit during the construction phase where possible. Any lighting required for safety purposes would be directed to avoid light spill onto retained habitats with after-dark lighting during the main period when bats are active (April to October) being minimised as far as is practicable.	During construction.

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Receptor	Objective	Mitigation	Timing
Breeding birds	To avoid impacts to breeding birds	Where possible, vegetation clearance would be minimised and undertaken outside the core bird nesting season (1st March and 31st August, though it should be noted that variation in dates is possible, for example from geographical variations in climate, or due to a particularly mild winter) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season would require an inspection of vegetation to be cleared for breeding birds and their occupied nests by a suitably qualified ecologist no more than 24 hours prior to any works being undertaken. If any nesting birds are identified during the survey, they would be left in situ for their entire nesting period and alternative approaches to the work proposed. This may include leaving an exclusion zone around the nests to avoid disturbance.	Prior to and throughout construction period. Breeding bird season defined as March – August inclusive (including potential allowance for seasonal variation)
Reptiles	To avoid impacts to reptiles.	Displacement of reptiles from areas of suitable habitat that would be lost or subject to significant disturbance during development. To be undertaken under a method statement, which would detail methods of site clearance to ensure impacts to reptiles are avoided. Changes to the Application Boundary along Bob Dunn Way have ensured installation of the Electrical Connection will not affect the adjacent reptile receptor site within Joyce Green Quarry.	Prior to and during construction.
Great crested	To avoid impacts to	If GCN are identified within the Electrical Connection Route	Prior to and during

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Receptor	Objective	Mitigation	Timing
newts (GCN)	great crested newts (if present)	<p>(currently none identified), then either:</p> <ul style="list-style-type: none"> ■ Works would be undertaken following receipt of a European Protected Species Licence from Natural England and any required mitigation; or ■ If works do not affect waterbodies and risks of encountering GCN within terrestrial habitats during construction are considered unlikely due to the small areas effected or the low suitability of habitats, a precautionary method statement would be produced setting out working methods to reduce the risk to GCN along with the rationale for why the proposed works are considered unlikely to lead to an offence being committed in relation to great crested newts and why a European Protected Species Licence (EPSL) is not required. 	construction.
Water voles	To avoid impacts to water voles.	<p>Impacts to water voles in the ditch adjacent to Norman Road from Electrical Connection route option 1 would be avoided by ensuring an offset of at least 5 m from the top of ditch bank, in accordance with standard guidance (The Mammal Society, 2016).</p> <p>Impacts to water voles (if present) within other sections of the chosen Electrical Connection Route would be avoided by leaving a 5 m offset between construction works any watercourses, or mitigated as required, through relocating animals under licence, or through habitat manipulation to</p>	Prior to and during construction.

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Receptor	Objective	Mitigation	Timing
		<p>encourage water voles away from discrete working areas.</p> <p>Changes to the Application Boundary along Bob Dunn Way have ensured installation of the Electrical Connection will not affect the adjacent water vole receptor site within Joyce Green Quarry. A trenchless solution will be used under the water vole receptor site, and a five metre buffer will be maintained between all above ground activities and the water vole receptor site at all times.</p>	
Invasive species	To facilitate appropriate invasive species control (Japanese knotweed, cotoneaster sp., and Himalayan balsam)	<p>The following measures would be employed prior to and during the construction phase:</p> <ul style="list-style-type: none"> ■ Invasive plant species to be resurveyed to map current location and distribution; ■ Invasive plants to be treated during the correct season by a licenced contractor to eradicate from site where practical; and ■ Until such a time that the plants have been removed from site, they will be fenced during construction work to ensure separation from construction activities to avoid spread. 	Prior to and during construction period
Otter	To avoid impacts to otter (if present)	If the final option of the Electrical Connection affects small areas of habitat which could theoretically fall within the territory of an otter, but are very unlikely to support an otter holt (ditches adjacent to existing road network), then further surveys will be undertaken to inform requirement for	Prior to and during construction.

Receptor	Objective	Mitigation	Timing
		mitigation measures. Mitigation measures would be informed by the results of any survey work, but in the event otter presence is confirmed would likely include avoidance of disturbance through no night-time working, maintaining the passage for otter along watercourses, and covering of excavations overnight.	

3.2 Operation

3.2.1 Measures to avoid, mitigate or compensate for impacts to biodiversity receptors within the Electrical Connection Route during the operation phase are set out in **Table 4** below.

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Table 4: Outline operation phase mitigation measures for the Electrical Connection Route and Cable Route Temporary Construction Compounds

Receptor	Objective	Mitigation	Timing
Crossness LNR ⁵ , Erith Marshes SINC, Belvedere Dykes SINC, and River Cray SINC	Satisfactory post-construction reinstatement	All excavations refilled to original levels. Existing topsoil reinstated. All construction materials removed. Any replanting and reseeding to be appropriate to location. N.B. In some sensitive habitats it will be appropriate to allow natural regeneration of vegetation.	Post- construction.
Habitats	Satisfactory post-construction reinstatement	All excavations refilled to original levels. Existing topsoil reinstated. All construction materials removed. Any replanting and reseeding to be appropriate to location. N.B. In some sensitive habitats it will be appropriate to allow natural regeneration of vegetation.	Post- construction.
Hard and soft landscaping	Satisfactory post construction establishment	Hard landscaping – any defects and snags made good. Soft landscaping – any plant failures replaced. within the first 5 years.	Post- construction.

⁵ The Thames Water managed Crossness LNR will no longer be directly affected due to changes in Application Site boundary submitted at Deadline 2, as described in 1.2.6 above.

4 General Mitigation Measures

4.1 Overview

4.1.1 General mitigation measures described within this Section set out principles which are applicable to addressing impacts across the whole of, or a large part of REP. These measures are generally applicable to a number of the biodiversity receptors where adverse effects have been identified.

4.2 Noise

4.2.1 Noise effects during construction would be mitigated through several measures (see **Chapter 8 Noise and Vibration** of the ES (**6.1, APP-045**) in line with BS 5228 Code of practice for noise and vibration control on construction and open sites, and set out in full within the outline CoCP. (**7.5, Rev 2**) Operational effects would be mitigated through selection of integrated plant with low noise outputs.

4.3 Emissions

4.3.1 Effects from emissions from REP during operation have been assessed and are reported within **Chapter 11 Terrestrial Biodiversity (6.1, REP2-023)** of the **ES**. Impacts through airborne emissions have been minimised through stack sensitivity analysis to provide an optimised stack height to adequately disperse emissions, and through adherence to requirements of the Industrial Emissions Directive (IED), emerging Draft Waste Incineration Directive BAT Reference Document (BREF) and the Medium Combustion Plant Directive. Therefore, no further mitigation above and beyond these measures is considered to be required to limit impacts of emissions.

4.4 Lighting

4.4.1 Construction impacts from lighting will be mitigated through the measures set out in the outline CoCP.

4.4.2 An Outline Lighting Strategy (see **Chapter 15 Other Considerations** of the **ES (6.1, APP-052)**) has been produced which considers the potential effects of exterior lighting required for REP on light sensitive receptors and establishes design objectives to minimise the effects of obtrusive light to within guideline levels. **Requirement 16** of the **dDCO (3.1, Rev 2)** sets out the need to secure an Operational Lighting Strategy which will be substantially in accordance with the Outline Lighting Strategy.

4.5 Construction Pollution

4.5.1 Construction will be undertaken in accordance with Guidance on Pollution Prevention (GPPs). GPPs provide environmental good practice guidance for the whole UK. Each GPP is targeted at a particular type of business or activity and covers environmental good practice to minimise pollution.

4.5.2 The CIRIA C532 (Control of water pollution from construction sites, 2001) are a series of publications developed by the Construction Industry Research and Information Association. Each document is targeted at a particular type of business or activity and covers environmental good practice to minimise pollution. Particular attention would be given to CIRIA C532 (Control of water pollution from construction sites, 2001). The CIRIA publications also make reference to environmental legal obligations and are available from: http://www.ciria.org/CIRIA/Resources/Resource_overview/Resources/Resource_overview.aspx?hkey=a80608d2-a045-4d72-8bb9-5ecf23f8d761.

4.6 Operational surface water

4.6.1 A surface water management strategy has been designed such that the rate of surface water run-off leaving the site and entering the adjacent watercourse network is limited to the 1 in 100-year greenfield rate of 35.3 l/s. Surface water storage would be provided by a below ground tanked system with capacity to cater for a 1 in 100-year plus climate change (40% increase in rainfall intensity) event. In accordance with planning policy requirements, surface water run-off from the REP site would therefore be managed in a sustainable manner and the strategy would deliver 'betterment' (in relation to water quality) when reviewed within the context of the existing (pre-development) surface water run-off regime.

4.7 Fencing of construction areas

4.7.1 When working in proximity to sensitive ecological receptors such as designated areas or retained habitats, working areas are to be fenced to demark the extent of the working area and avoid accidental impacts to receptors from encroachment of construction activities. To withstand construction activities, a robust fencing such as Heras or post and rail should be used.

5 Biodiversity Offsetting

- 5.1.1 As described in **Section 1**, the principles of the mitigation hierarchy⁶ have been adopted and used when developing measures to address impacts on biodiversity receptors. The principles of the mitigation hierarchy are that in order of preference impacts on biodiversity should be subject to avoidance, mitigation, and compensation. Where possible effects from REP have been avoided or mitigated.
- 5.1.2 In addition, to ensure the Proposed Development meets requirements within current planning policy in relation to delivery of biodiversity net gain, the Applicant commits to delivering a minimum of 10% biodiversity net gain.
- 5.1.3 Due to the limited area of the REP site, it is not possible to avoid or mitigate all impacts through temporary and permanent loss of habitats. Compensation, or biodiversity offsetting, would be provided to offset residual effects resulting from the loss of habitats within the REP site, as well as providing a minimum of 10% biodiversity net gain. This will be delivered through a financial contribution to the Environment Bank with a legal agreement for contribution towards enhancement of habitats outside the Application Boundary. The biodiversity metric (developed by the Department for Food and Rural Affairs (DEFRA)) will be used to quantify the potential habitat losses and gains as a result of REP, in order to determine the extent of off-site compensatory measures, and financial sum, required to achieve the aim of net biodiversity gain, in accordance with local and national policy. During consultation Natural England have been supportive of the use of the DEFRA metric for assessing impacts and developing offset measures.
- 5.1.4 The Applicant has been, and is in, discussions with the Environment Bank regarding the biodiversity metric and these discussions have informed this OBLMS, which will evolve to the BLMS post determination of the DCO. A draft biodiversity metric for REP has been produced by, and discussed with, the Environment Bank to inform the development of offsetting proposals. Further details can be found within the **Biodiversity Accounting Report (8.02.09, REP2-060)** submitted at Deadline 2. This indicative calculation has been based on the two following scenarios:
- "Realistic Worst Case Overall Route (Submission Stage)" This scenario provides for what would have been the worst overall route, including through Crossness Local Nature Reserve (LNR), Erith Marshes Site of Importance for Nature Conservation (SINC), the River Cray Public Open Space and SINC, and running within the Dartford Marshes Local Wildlife Site (LWS). Biodiversity effect outcomes within this scenario would be representative of a realistic worst case based on the Revision 0 of the Order Limits (i.e. at the time of submission). The Realistic Worst Case

⁶ CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Section 6. Chartered Institute of Ecology and Environmental Management, Winchester.

Overall Route (Submission Stage) scenario chooses a 10m corridor that incorporates the most valuable habitats, in biodiversity terms, within the Order Limits at the time of submission. However, as already noted, this Reasonable Worst Case cannot be realised, given the reduction in the Order Limits and the removal of some of these most valuable habitats. It is therefore only shown for illustration purposes and to demonstrate the improvements that the Applicant has already made to the Proposed Development in order to reduce impacts on biodiversity.

- "Realistic Best Case" This scenario provides for the impacts that are likely to represent the effects when the Proposed Development is delivered, based on the understanding of design evolution and practicalities of implementation at the time of the setting of the assumptions. However, the realistic best case also "builds in" an acknowledgement that uncertainty remains within this scenario. For example, assuming a 10 m working corridor for the installation of the electrical connection route, the "Realistic Best Case" avoids Crossness LNR, the River Cray Public Open Space and SINC and the majority of the Dartford Marshes LWS but still acknowledges the potential for impacts within specific areas of verge and other green space along the connection route. Whilst the final routing may achieve even better outcomes when constructed, and this is not precluded, the "Realistic Best Case" is considered to represent a sensible balance, i.e. it is not the "absolute" best case. The Realistic Best Case is closely aligned with the Applicant's recently updated single Electrical Connection route (as per the **Works Plans (2.2, REP2-004)**), subject to commentary at key locations provided below.

5.1.5 The scenarios were derived prior to completion of further route analysis by UKPN, which has resulted in a single Electrical Connection route being chosen as set out in the **Electrical Connection Progress Report (8.02.07, REP2-058)** comprising part of the submission for Deadline 2. The scenarios represented the realistic cases at either end of a range of potential metric outcomes.

5.1.6 Should the DCO be granted, the indicative metric will be updated at the detailed design stage, the details of which will be included in the final BLMS. The final BLMS, which must be substantially in accordance with the OBLMS, will be submitted to and approved by the relevant planning authorities (London Borough of Bexley and Dartford Borough Council), in accordance with **Requirement 5** of the **dDCO (3.1, Rev 2)**. The Environment Bank approach is likely to take the form of habitat improvements to existing habitats in the local area.

Biodiversity offsetting principles

5.1.7 Biodiversity offsetting principles establish a framework for designing and implementing biodiversity offsets and verifying their success. Biodiversity offsets should be designed to comply with all relevant national and international law and planned and implemented in accordance with the

Convention on Biological Diversity and its ecosystem approach, as articulated in National Biodiversity Strategies and Action Plans (BBOP 2012). When seeking to implement an offset the following principles should be met where possible:

1. Landscape context: A biodiversity offset should be designed and implemented in a landscape scale context to achieve the expected measurable conservation outcomes taking into account the available information on the full range of biological, social and cultural values of biodiversity and supporting ecosystem approach;
 2. No net loss: A biodiversity offset should be designed and implemented to achieve in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain;
 3. Additional conservation outcomes: A biodiversity offset should achieve conservation outcomes above and beyond results that should have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations;
 4. Stakeholder participation: In areas affected by the Proposed Development and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, implementation and monitoring;
 5. Equity: A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognised rights of indigenous peoples and local communities;
 6. Long-term outcomes: The design and implementation of the biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last as long as the effects from the Proposed Development;
 7. Transparency: The design and implementation of the biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner; and
 8. Science and traditional knowledge: The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.
- 5.1.8 Whilst universal, many of these principles are more, or less, applicable depending on the national circumstances. In the UK, principles 1, 2, 3, 6, 7 and 8 are key, and all are applied at REP.

5.2 Deliverables

5.2.1 The final BLMS will include a report on the planned measures, which would provide:

- an overview of the biodiversity accounting process;
- details of how key habitat assessment decisions have been made;
- an overview of the gross biodiversity impacts and net losses or gains;
- details of anticipated offsite biodiversity compensation requirements and their phasing; and
- any long-term management and monitoring commitments in respect of the off-setting.

5.2.2 The Applicant has provided a copy of the **Biodiversity Accounting Report (8.02.09, REP2-060)** at Deadline 2, which presents the results of biodiversity metric calculations of the value of potential habitat losses and gains associated with the Proposed Development, to determine the likely value of the required offset and net gain requirements in terms of Biodiversity Units (BU). The metric calculations have been undertaken with reference to the two impact scenarios described above.

5.2.3 The Applicant has confirmed that a Biodiversity and Landscape Mitigation Strategy, delivered through **Requirement 5 of Schedule 2** to the **dDCO (3.1, Rev 2)**, will be prepared prior to commencement and will include the final results of a Biodiversity Accounting Assessment which will confirm the value of the required offset and net gain requirements (in accordance with local and national policy), with a preference to deliver the biodiversity creation or enhancements in the local area, targeting the enhancement and restoration of Habitats of Principal Importance.

6 References

British Standard 5228 Code of practice for noise and vibration control on construction and open sites.

British Standard 5837:2012 Trees in relation to design, demolition and construction.

CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Section 6. Chartered Institute of Ecology and Environmental Management, Winchester.

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