Riverside Energy Park Belvedere

EIA Scoping Report

On behalf of **Cory Riverside Energy**

Project Ref: 42166 | Rev: Final | Date: November 2017

Document Control Sheet

Project Name: **Riverside Energy Park, Belvedere**

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Report Title: **EIA Scoping Report**

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For and on behalf of Peter Brett Associates LLP				

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1.1 Overview

1.1.1 Cory Environmental Holdings Limited (trading as Cory Riverside Energy) (Cory) intends to apply for consent to build, commission and operate an integrated Energy Park consisting of complementary energy generating development, with an electrical output of up to 96 megawatts (MWe), together with a new connection to the existing electricity network and provision for Combined Heat and Power (CHP) readiness. The proposed development, located in Belvedere in the London Borough of Bexley, would be known as 'Riverside Energy Park' and would be sited adjacent to an existing Energy Recovery Facility (ERF) (referred to as Riverside Resource Recovery Facility (RRRF)) also currently operated by Cory. A location plan and indicative application boundary are provided in **Appendix A** and **B.**

1.1.2 This Environmental Impact Assessment (EIA) Scoping Report has been prepared by Peter Brett Associates LLP (PBA) on behalf of Cory in relation to the proposed development.

1.2 Purpose of this Report

1.2.1 The proposed development constitutes a project falling within the definition of a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 by virtue of building, commissioning and operating an onshore generating station with an energy generating capacity of greater than 50 MWe. Consent for the proposed development would therefore require a Development Consent Order (DCO) and the process of EIA is governed by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').

1.2.2 It is considered that the location, scale and nature of the proposed development, notwithstanding the selection criteria in Schedule 3 of the EIA Regulations, may have the potential to give rise to significant effects on the environment. Accordingly, the proposed development is considered to fall within Schedule 2 part 3a of the EIA Regulations and is considered to be an 'EIA development' for the purposes of those Regulations. The DCO application will therefore be accompanied by an Environmental Statement (ES), prepared in accordance with the EIA Regulations.

1.2.3 This scoping report has been prepared on behalf of Cory to assist the Secretary of State (SoS) in preparing a Scoping Opinion under the EIA Regulations setting out the scope of the information that should be contained in the ES. It outlines the initial consideration of likely significant environmental effects which the EIA would need to examine and the preliminary scope of the information which would be provided in the ES.

1.2.4 The environmental topics which are proposed to be included in the EIA scope, and those which are not, are presented in **Chapters 7 and 8** respectively. Accordingly, this scoping report details how the likely significant environmental effects which have been included in the EIA scope are proposed to be examined and progressed as part of the EIA. The aim of the EIA is to ensure that the development has due regard for the environment, minimises adverse environmental effects and takes advantage of opportunities for environmental enhancement. This scoping report also identifies those topics which are proposed to be scoped out of the EIA as significant effects are not likely, along with the rationale for so-doing.

1.2.5 This scoping report provides information to consultees regarding the proposals pursuant to the EIA Regulations and sets out the proposed scope of the EIA and content of the ES.

1.2.6 This scoping report constitutes a formal request for a Scoping Opinion under Regulation 10(1) of the EIA Regulations.

1.3 Report Structure

1.3.1 This scoping report continues as follows:

- Chapter 2 Proposed Development
- Chapter 3 The Site and the Surrounding Area
- Chapter 4 Regulatory and Policy Background
- Chapter 5 The EIA Process
- Chapter 6 Proposed Scope of the EIA
- Chapter 7 Topics Included in the EIA Scope
- Chapter 8 Topics Not Included in the EIA Scope
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2 Proposed Development

2.1 Proposed Development

2.1.1 Riverside Energy Park, hereafter referred to as 'REP', would combine a waste Energy Recovery Facility (ERF), battery storage, a roof-mounted solar photovoltaic installation, an anaerobic digestion facility and provision for CHP readiness. REP would generate a nominal rated electrical output of up to 96 MWe. However, after satisfying its own power needs and excluding battery stored power, REP would likely export a lower output to the national electricity network.

2.1.2 REP would require a new connection to the existing electricity network as outlined below. The route of the electrical connection, from REP to the electrical connection point, is hereafter referred to as 'the electrical connection route'.

2.1.3 Collectively, the REP site, the electrical connection route, and temporary works areas are referred to as the 'application site'.

2.1.4 It is anticipated that construction of the proposed development would commence in 2021, with an anticipated operational start date during 2024.

2.1.5 A location plan is provided in **Appendix A,** and an Indicative Application Boundary is shown in **Appendix B**. The application site (as currently set by the Indicative Application Boundary) falls within the administrative boundaries of the London Borough of Bexley (LBB), the Royal Borough of Greenwich (RBG), the London Borough of Barking and Dagenham (LBBD), and Dartford Borough Council (DBC).

2.1.6 The principal elements of REP are described below.

Energy Recovery Facility

2.1.7 A proposed two stream ERF to provide thermal treatment of Commercial and Industrial (C&I) waste, with the potential for municipal solid waste (MSW), utilising moving grate combustion, flue gas treatment and water steam cycle for the production of electricity and heat. It is envisaged that the ERF would likely have a nominal throughput of approximately 655,000 tonnes per annum (tpa). For the purpose of testing a robust scenario in the EIA, an annual maximum throughput of approximately 805,000 tpa will be assumed.

2.1.8 The ERF building is anticipated to have the same north-south orientation as the existing RRRF, but arranged such that the stack is located at the northern end. This arrangement would respond to the constrained nature of the available site, offer operational benefits, and enable extensive utilisation of the roof for solar panels.

2.1.9 The height of the stack will be determined through detailed dispersion modelling such that the dispersion of flue gases would not result in significant air quality effects on sensitive receptors.

Solar Photovoltaic Installation

2.1.10 The proposed layout of REP would enable solar photovoltaic provision to be integrated across a wide extent of the roof, and would be similar to typical roof mounted solar panels.

Battery Storage

2.1.11 The battery storage component would supply additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the main REP building.

Anaerobic Digestion Facility

2.1.12 The anaerobic digestion facility would be sized to process up to approximately 40,000 tpa of food and green waste. It is envisaged that this waste would be predominantly sourced from the LBB and delivered to REP by road. Solid digestate, an output of the anaerobic digestion process will be used as a fuel in the ERF to generate electricity, or alternatively it would be transferred off-site for use in the agricultural sector as fertilizer.

2.1.13 This facility would be fully integrated into the main REP building, however for reasons of safety the gas flares and bag would be separate from the main REP building (but still sited closely within the REP site).

Combined Heat and Power Connection

2.1.14 REP would be CHP enabled with necessary infrastructure within the REP site (heat exchangers, pumps, pressurisation system) included.

2.1.15 It is envisaged that the heat connection could service nearby residential developments such as the Thamesmead area, as well as other potential end users. Any CHP infrastructure outside of the application site would not form part of the application for development consent.

The Electrical Connection Route

2.1.16 REP would be connected to the existing National Electrical Transmission System (NETS) via a new 132 kilovolt (kV) distribution network connection ('the Electrical Connection'). It is proposed that the Electrical Connection would be routed predominantly via the existing road network and would be underground except for the connection point with REP itself and at the connection point to the NETS. This would necessarily require a new substation within the REP site.

2.1.17 There are currently two route options under consideration, to be confirmed through consultation with UK Power Networks (UKPN), who would own and operate the new Electrical Connection, as follows:

- Option 1 – the new cable route would head northwest from REP and follow the existing RRRF Electrical Connection route, to its connection point north of the River Thames at the existing National Grid substation on Renwick Road, Barking. This option would utilise the existing electricity cable tunnel under the river; or

- Option 2 – the new cables would be routed within the existing road network to a connection point at the existing National Grid Littlebrook Power Station substation, south east of REP.

2.1.18 Both Electrical Connection options have been included within the Indicative Application Boundary at this stage. Selection of a single electrical connection point will be confirmed through consultation with UKPN, taking account of their statutory obligations, and therefore a route to a single point of connection to the TENS will ultimately be included within the subsequent DCO application.

Delivery of waste to REP

2.1.19 It is proposed to deliver the majority of waste to REP by barge from Waste Transfer Stations (WTS) along the River Thames, utilising the existing jetty as per the existing RRRF. The remainder would be delivered by road. The proportions of the total to be delivered by road and river will be determined through further assessment work.

Removal of by-products from REP

2.1.20 Incinerator Bottom Ash (IBA) (approximately 25% of throughput) would be transported by river to the existing IBA Facility at the Port of Tilbury for treatment/recycling, and then onward use as secondary aggregate in the construction sector.

2.1.21 Air Pollution Control Residues (APCR) (approximately 3% of throughput) would be taken off site by road in sealed containers to be recycled.

2.2 Construction

2.2.1 Details of construction phasing and proposed construction methods are currently being developed. It is envisaged that a draft Construction Environmental Management Plan (CEMP) would be prepared during the course of the assessment work and submitted with the application for development consent. This would set out principles, controls and management measures which would be implemented during construction to manage potential significant impacts. The principles set out in the draft CEMP would be taken into account as part of the EIA.

2.2.2 At this stage, it is anticipated that temporary laydown areas will be required for the construction of REP. It is proposed to utilise land south of REP immediately west of Norman Road and/or land to the east of the REP site adjoining Crabtree Manorway North. These areas are included within the Indicative Application Boundary.

2.2.3 In order to facilitate construction of REP, temporary works in the River Thames may be required. Cory are currently exploring two potential options for this element of the proposed works. The first would be to install a temporary causeway across the intertidal zone, where self-propelled multi-axle trailers would roll the construction modules off a barge. The second option would include the use of a lift crane, which could be either located on a jetty head constructed in the river or constructed near the river bank, which would directly lift the modules from a barge into the site. Both options would require provision to lift the construction modules over the flood defence wall and the Thames River Path. Some localised dredging may also be required to ensure sufficient vessel access during the tidal cycle.

2.2.4 The marine related works would be temporary and limited to the construction phase of the proposed development. In this context, all marine infrastructure would be removed at the end of the construction phase and any riverbed restoration undertaken at this point in time. Accordingly, all impacts associated with the marine works (including the decommissioning of any structures) are considered to occur in the construction phase only.

2.3 Decommissioning

2.3.1 For the purpose of the EIA and in order to allow a decommissioning assessment to be presented in the ES, a working assumption has been used that REP has an operational lifetime of 40 years. However, it should be noted that it is common for such developments to be operational for longer periods. In the case of REP, a decision would be made at the appropriate time as to whether it would be ‘re-powered’ after 40 years (depending on the condition of plant items and the nature of the electricity market at that time). As such, the working assumption has been made for the purposes of the ES that after 40 years, the REP generating equipment would be removed and land re-instated to an agreed condition.

2.3.2 For the purposes of this request, any decommissioning phase is assumed to be of a similar duration to construction, and therefore environmental effects are considered to be of a similar level to those during the construction phase.

3 The Site and the Surrounding Area

3.1 Site Location and Description

The REP site

3.1.1 The REP site comprises approximately 7 hectares (ha) of land located approximately at National Grid Reference (NGR) TQ 49467 80680, accessed off Norman Road, Belvedere, London DA17 6JY in the LBB, immediately to the west of the existing RRRF. This area is referred to within this scoping report as the 'REP site'.

3.1.2 The REP site is irregular in shape, and is predominantly used by Cory as an ancillary area for the existing RRRF located at the same address as outlined above.

3.1.3 The REP site includes the existing jetty in the River Thames which is currently used for delivery of waste and despatch of some by-products at the existing RRRF. The jetty will be used for the same purpose for the operation of REP.

3.1.4 Existing land uses of the REP site include:

- Ash storage containers – container storage on concrete hardstanding;
- Boundary fencing and associated lighting;
- Circulation roads;
- Compounds for the maintenance of operational plant machinery (consisting of concrete hard standing, boundary fencing, lighting, portakabins, metal containers and permanent storage sheds);
- Car parking; and
- On-site non-designated Wasteland Habitat Area (WHA).

3.1.5 The REP site is accessed from Norman Road which extends south from the site to the A2016/Eastern Way Strategic Road Network (SRN), which runs in an east/west orientation.

3.1.6 A Location Plan is detailed in **Appendix A,** and an Indicative Application Boundary is detailed in **Appendix B.**

The Electrical Connection site

3.1.7 The Electrical Connection site for Electrical Connection Route Option 1 runs adjacent to the A2016 towards the Thamesmead residential area, before following other routes on the existing road network. An existing tunnel under the River Thames would be utilised to reach the electrical connection point at the existing National Grid Substation on Renwick Road, Barking.

3.1.8 The Electrical Connection site for Electrical Connection Route Option 2 would run within the existing road network through the residential areas of Erith, and the northern section of Crayford and Dartford, to the existing electrical connection point at the Littlebrook Power Station substation.

Temporary Laydown areas

3.1.9 Temporary laydown areas are proposed on land to the immediate west of Norman Road, which links the REP site with the A2016, and on land to the south-east of the REP site and west of Crabtree Manorway North. Both these temporary laydown areas are brownfield sites situated adjacent to existing industrial/commercial use buildings and are within 0.5 km of the REP site. The temporary laydown areas are shown on the Illustrative Zoning Plan at **Appendix C**.

3.2 The Surrounding Area

3.2.1 REP is considered to be consistent with the land uses surrounding the REP site, as the immediate environs on both the northern and southern banks of the River Thames predominantly comprise established industrial areas with relatively tall structures.

3.2.2 Immediately to the east of the REP site lies the existing RRRF, a three stream ERF with a maximum consented waste throughput of 785,000 tpa generating up to 72 MWe.

3.2.3 Approximately 270 m to the west of REP is the Thames Water Crossness Sewage Treatment Works (STW), which covers an area of approximately 50 ha. One of the largest STW in the UK, this facility serves approximately two million people. A central feature of this STW is the existing facility, located in the north-eastern corner of the site, which burns centrifuged sludge from the STW.

3.2.4 To the east, beyond RRRF, lies the Crabtree Industrial Estate. This estate covers an area of approximately 150 ha and is bordered to the north and east by the River Thames. Serviced by the same road network as the REP site, the Crabtree Industrial Estate consists of multiple shed units of varying sizes, the largest being the Lidl Distribution Depot at approximately 3 ha.

3.2.5 The Crossness Nature Reserve abuts the REP site's southern and western boundaries, covering an area of approximately 25.5 ha. It forms part of the Erith Marshes Site of Importance for Nature Conservation (SINC) and includes areas of scrub, rough grassland, ponds and ditches.

3.2.6 A network of Public Rights of Way (PRoW) surround the REP site, linking Norman Road with the Thames Path to the north. A PRoW originates at the junction of Norman Road and the A2016, which extends northwest through the Crossness Nature Reserve to its border with the Thames Water Crossness STW. From here this PRoW extends north to the Thames Path, and south to the A2016.

3.2.7 Located on the northern bank of the River Thames, lies an automobile storage area of approximately 22 ha, the Ford Motor Company Truckfleet Compound (approximately 25 ha), the Dagenham Engine Plant (approximately 22 ha), along with the Eurovia Roadstone and Hanson Asphalt facilities.

3.2.8 Multiple tall structures are evident in the immediate environs of the REP site, including stacks and chimneys (such as those at the existing RRRF and the adjoining STW facility), and wind turbines (three being located along the northern bank of the Thames, with one at the adjoining STW facility to the west).

3.2.9 The closest residential area to the REP site is Belvedere, which lies approximately 800 m to the south. The residential area of Abbey Wood lies approximately 1,950 m south west and the residential area of Thamesmead lies approximately 1,560 m west.

3.2.10 Belvedere train station is located approximately 1.3 km to the south servicing London Cannon Street, Dartford, Gravesend and Gillingham. The Docklands Light Railway also services the area with its connection at Woolwich Arsenal, approximately 6.0 km to the south west.

4 Regulatory and Policy Background

4.1 Introduction

4.1.1 The proposed development will be progressed taking account of policies at the national, regional and local level set out in this chapter.

4.2 National Planning Policy and Guidance

Overarching National Policy Statement for Energy (EN-1) (DECC, 2011)

4.2.1 Part 3 The need for new nationally significant energy infrastructure projects:

- 3.3 The need for new nationally significant electricity infrastructure projects
- 3.4 The role of renewable electricity generation
- 3.7 The need for new electricity network infrastructure
- 3.8 The need for nationally significant gas infrastructure

4.2.2 Part 4 Assessment Principles:

- 4.1 General points
- 4.2 Environmental Statement
- 4.3 Habitats and Species Regulations
- 4.4 Alternatives
- 4.5 Criteria for “good design” for energy infrastructure
- 4.6 Consideration of Combined Heat and Power (CHP)
- 4.8 Climate change adaptation
- 4.9 Grid connection
- 4.10 Pollution control and other environmental regulatory regimes
- 4.11 Safety
- 4.12 Hazardous Substances
- 4.13 Health
- 4.14 Common law nuisance and statutory nuisance
- 4.15 Security considerations

4.2.3 Part 5 Generic Impacts

National Policy Statement for Renewable Energy Infrastructure (EN-3) (DECC, 2011)

4.2.4 Part 2 Assessment and technology-specific information:

- 2.3 Climate Change Adaptation
- 2.4 Criteria for “good design” for energy infrastructure
- 2.5 Biomass and Waste Combustion

National Policy Statement for Electricity Networks Infrastructure (EN-5) (DECC, 2011)

4.2.5 Part 2 Assessment and Technology-Specific Information:

- 2.3 General assessment principles for electricity networks
- 2.4 Climate change adaptation
- 2.5 Consideration of good design

National Planning Policy Framework (DCLG, 2012)

- Chapter 1 Building a strong, competitive economy
- Chapter 10 Meeting the challenge of climate change, flooding and coastal change
- Chapter 11 Conserving and enhancing the natural environment

Planning Practice Guidance (DCLG, 2016)

- Air quality
- Climate change
- Environmental Impact Assessment
- Land affected by contamination
- Natural environment
- Noise
- Renewable and low carbon energy
- Waste

4.2.6 Other relevant national planning policy and guidance documents include:

- National Planning Policy for Waste (DCLG, 2014)
- Energy from waste - A guide to the debate (DEFRA, 2014)

4.3 Regional Planning Policy and Guidance

London Plan (Greater London Authority, 2016)

4.3.1 Chapter 5 London's response to climate change:

- Policy 5.4A Electricity and gas supply
- Policy 5.5 Decentralised energy networks
- Policy 5.6 Decentralised energy in development proposals
- Policy 5.7 Renewable energy
- Policy 5.8 Innovative energy technologies
- Policy 5.9 Overheating and cooling
- Policy 5.10 Urban greening
- Policy 5.11 Green roofs and development site environs
- Policy 5.12 Flood risk management
- Policy 5.13 Sustainable drainage
- Policy 5.16 Waste net self-sufficiency
- Policy 5.17 Waste capacity
- Policy 5.18 Construction, excavation and demolition waste
- Policy 5.19 Hazardous waste
- Policy 5.21 Contaminated land
- Policy 5.22 Hazardous substances and installations

4.3.2 Chapter 6 London's transport:

- Policy 6.11 Smoothing traffic flow and tackling congestion
- Policy 6.12 Road network capacity
- Policy 6.14 Freight

4.3.3 Chapter 7 London's living spaces and places:

- Policy 7.13 Safety, security and resilience to emergency
- Policy 7.14 Improving air quality
- Policy 7.15 Reducing and managing noise, improving and enhancing the acoustic environment and promoting appropriate soundscapes
- Policy 7.19 Biodiversity and access to nature
- Policy 7.20 Geological conservation

- Policy 7.26 Increasing the use of the blue ribbon network for freight transport
- Policy 7.29 The River Thames

4.3.4 Chapter 8 Implementation and monitoring review:

- Policy 8.2 Planning obligations
- Policy 8.3 Community infrastructure levy

London's Wasted Resource – (The Mayor's Municipal Waste Management Strategy 2011)

4.3.5 Chapter 2 Current performance on managing London's municipal waste

4.3.6 Chapter 5 Delivering change - policies and proposals:

- Policy 2: Reducing the climate change impact of London's municipal waste management
- Policy 3: Capturing the economic benefits of municipal waste management
- Policy 4: Achieving high recycling and composting rates resulting in the greatest environmental and financial benefit
- Policy 5: Stimulating the development of new municipal waste management infrastructure, particularly low carbon technologies

4.4 Emerging Regional Planning Policy and Guidance

Draft New London Plan

4.4.1 The Greater London Authority (GLA) is preparing a new statutory Development Plan for London. The adopted London Plan sets overall strategic planning for London and provides the policy framework for local plans across London. Its policies need to be given due regard in decisions under the Planning Act 2008 within Greater London.

4.4.2 According to the GLA, the New London Plan will undergo consultation between December 2017 and March 2018 with examination in public scheduled for Autumn 2018 and publication of the final London Plan scheduled for Autumn 2019.

Draft London Environment Strategy (2017)

- Chapter 4 Air quality
- Chapter 6 Climate change mitigation and energy
- Chapter 7 Waste

Draft Mayor's Transport Strategy 2017

4.4.3 On 21st June 2017 the GLA published a draft of the Mayor's Transport Strategy which sets out policies and proposals to reshape transport in London over the next 25 years. The first consultation on the Mayor's Transport Strategy closed on 2nd October 2017. According to the GLA the Mayor's Transport Strategy will be published in 2018.

4.5 Local Planning Policy and Guidance

Bexley Core Strategy (LBB, 2012)

4.5.1 Chapter 4 Managing the built and natural environment:

- Policy CS01 Sustainable development
- Policy CS08 Adapting to and mitigating the effects of climate change, including flood risk management
- Policy CS09 Using Bexley's resources sustainably
- Policy CS12 Bexley's future economic contribution
- Policy CS13 Access to jobs
- Policy CS15 Integrated transport system
- Policy CS17 Green infrastructure
- Policy CS18 Biodiversity and geology
- Policy CS20 Sustainable waste management

London Borough of Bexley Unitary Development Plan Saved Policies (LBB, 2012)

4.5.2 Chapter 5 Environment:

- Policy ENV40 - contamination and remedial treatment of land
- Policy ENV41 - Air Quality Strategies and preparation of an Air Quality Assessment

4.5.3 Chapter 7 Employment:

- Policy E1 - criteria for proposed industrial and commercial development

4.5.4 Chapter 8 Transport:

- Policy T6 - optimising use of the existing transport network

4.5.5 Chapter 12 Thames-side:

- Policy TS1 - business development areas
- Policy TS13 & 14 - Thames-side Environment
- Policy TS15 - Thames-side Biodiversity

4.5.6 Chapter 14 Minerals and Waste Processing:

- Policy MIN1 - environment, amenity and safety issues

London Borough of Bexley Energy Masterplan (LBB, 2016)

4.5.7 Chapter 4 Energy Supply Appraisal:

- 4.1 Riverside Resource Recovery Facility

4.5.8 Chapter 6 Heat Network Infrastructure Proposals:

- 6.5 Heat Offtake Arrangement from RRR Facility

London Borough of Barking and Dagenham Core Strategy (LBBD, 2010)

- Strategic Objective SO.8
- Strategic Objective SO.9
- Policy CR1 - Climate Change and Environmental Management.
- Policy CR2 - Preserving and Enhancing the Natural Environment
- Policy CR3 - Sustainable Waste Management
- Policy CR4 - Flood Management
- Policy CP2 - Protecting and Promoting our Historic Environment

London Borough of Barking and Dagenham Site Specific Allocations DPD (LBBD, 2010)

4.5.9 Key Regeneration Areas and Significant Housing Sites:

- SSA SM1 Barking Riverside
- SSA SM13 Thames View Regeneration Sites

London Borough of Barking and Dagenham Development Policies DPD (LBBD, 2011)

- Policy BR1 - Environmental Building Standards
- Policy BR5 - Contaminated Land
- BR13 - Noise Mitigation
- BR14 - Air Quality
- BR15 - Sustainable Waste Management
- Policy BC11 - Utilities
- Policy BC12 - Telecommunications
- Policy BP11 - Urban Design
- Policy BP2 - Conservation Areas and Listed Buildings
- Policy BP3 - Archaeology

Royal Greenwich Local Plan Core Strategy with detailed policies (RBG, 2014)

4.5.10 Chapter 3 Spatial Strategy:

- 3.3 The places of Royal Greenwich / locations for strategic development

4.5.11 Chapter 4 Strategic and Detailed Policies

- Policy OS1 Open Space
- Policy OS4 - Biodiversity
- Policy OS(f) - Ecological Factors
- Policy OS(g) - Green and River Corridors
- Policy E1 - Carbon Emissions
- Policy E2 - Flood Risk
- Policy E3 - Residual Flood Risk
- Policy E(c) - Air Pollution
- Policy IM1 - Infrastructure
- Policy IM(a) - Impact on the Road Network
- NC22 - Sites of Importance for Nature Conservation

Dartford Borough Council Core Strategy (DBC, 2011)

4.5.12 Chapter 2 where development will take place:

- CS1 - Spatial Pattern of Development
- CS6 - Thames Waterfront

4.5.13 Chapter 3 managing development:

- CS14 - Green Space
- CS16 - Transport Investment

4.5.14 Chapter 5 sustainable growth:

- CS23 - Minimising Carbon Emissions
- CS24 - Flood Risk
- CS25 - Water Management

Dartford Borough Council Development Policies Plan (DBC, 2017)

- Policy DP3 - Transport Impacts of Development
- Policy DP5 - Environmental and Amenity Protection
- Policy DP11 - Sustainable Technology and Construction
- Policy DP13 - Designated Heritage Assets
- Policy DP20 - Identified Employment Areas
- Policy DP23 - Protected Local Green Space
- Policy DP24 - Open Space
- Policy DP25 - Nature Conservation and Enhancement

4.6 Emerging Local Planning Policy and Guidance

London Borough of Bexley Draft Local Plan

4.6.1 The LBB is preparing a Local Plan which will set out policies to guide development across the Borough up to 2040. The call for sites consultation took place between the 19th June and 18th August 2017. The next round of consultation on the preferred approach to Local Plan policies is scheduled to take place in November/December 2017.

5 The EIA Process

5.1 EIA Regulations

5.1.1 The process of EIA for projects falling under the Planning Act 2008 is governed by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, the "EIA Regulations". The EIA Regulations implement EC Directive 2011/92/EU, as amended by Directive 2014/52/EU, into domestic legislation.

5.1.2 As set out above in paragraph 1.2.2, REP falls with Schedule 2 part 3a of the EIA Regulations. Given the location, scale and nature of the proposed development, notwithstanding the selection criteria in Schedule 3 of the EIA Regulations, it is considered that REP may have the potential to give rise to significant effects on the environment. This Scoping Report is provided in accordance with Regulation 10 of the EIA Regulations.

5.1.3 The EIA Regulations set out the requirements for undertaking an EIA, and Regulation 14 and Schedule 4 detail the required information for inclusion in an ES. For ease of reference, Regulation 10, Regulation 14 and Schedule 4 of the EIA Regulations are presented in **Appendix D**.

5.2 Consultation

5.2.1 The Planning Act 2008, and secondary legislation including the EIA Regulations, sets out the statutory requirements for consulting with prescribed consultees and the local community (in Sections 42 and 47 of the Planning Act 2008 respectively).

5.2.2 In accordance with its statutory duties, Cory will undertake statutory consultation including the publication of a Preliminary Environmental Information Report (PEIR) during the pre-application phase.

5.2.3 The involvement of both statutory and non-statutory stakeholders can result in benefits for all parties, through eliciting environmental information which may not otherwise have come to light, increasing trust and transparency as well as providing an opportunity to address potential concerns. In accordance with Section 49 of the Planning Act 2008, Cory will have regard to any consultation responses and feedback received in the further design development of the REP proposals, and assessment of the likely significant environmental effects.

5.2.4 In addition to the statutory requirements, Cory is also intending to undertake prior non-statutory engagement in order to identify any issues earlier in the development process.

5.3 Assessment

5.3.1 In general terms the main stages in the EIA are as follows:

- Data Review – draw together and review available data;
- Scoping – identify significant issues, determine scope of EIA;
- Baseline Surveys – undertake baseline surveys and monitoring;
- Preliminary Assessment – initial assessment of likely significant effects, and publication of preliminary assessment in the PEIR;
- Assessment and Iteration – assess likely significant effects of development, evaluate alternatives, provide feedback to design team on adverse effects, incorporate any necessary mitigation, assess effects of mitigated development; and
- Preparation of the ES.

5.3.2 The proposed scope of the EIA and approach to the assessment of likely significant effects is

set out in **Chapter 6.**

5.4 Mitigation

5.4.1 One of the most important functions of the EIA process is to identify ways to mitigate identified adverse environmental effects and identify opportunities that a proposed development may have for environmental improvements. The EIA Regulations require an ES to contain: "*A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment".*

5.4.2 A hierarchy of methods for mitigating significant adverse effects will be followed, which are, in order of preference:

- Enhancement - opportunities that the proposed development may provide to enhance the local and wider environment (e.g. ecological enhancement or provision of jobs);
- Avoidance – designing the proposed development in such a way that avoids effects on the environment (e.g. locating sensitive infrastructure above flood levels);
- Reduction – design the development or employ construction methodologies such that significant effects identified are reduced (e.g. employment of sustainable drainage to mitigate effects of development in flood prone areas); and
- Compensation – providing off-site enhancement in order to compensate for where onsite mitigation has not been possible (e.g. financial contributions towards local infrastructure).

5.4.3 Environmental effects remaining after mitigation measures have been incorporated are termed residual effects and these will be fully described in the ES.

Embedded and Further Mitigation

5.4.4 There is a distinction between mitigation that is incorporated or 'embedded' into the design of the development (embedded mitigation) and mitigation that is subsequently identified in order to prevent, reduce or offset any remaining significant adverse effects (further mitigation). Embedded mitigation may include, for example, incorporating habitat areas into the proposed development design, or incorporation of appropriate drainage attenuation.

5.4.5 Embedded mitigation evolves through the iterative design process and early consideration of the likely significant impacts. The ES will document the embedded mitigation measures which have been employed within the design in response to the identification of potentially significant effects. The ES, within each of the topic chapters as appropriate, will also document the further mitigation that is required to complement the embedded mitigation.

5.4.6 A summary of all mitigation measures and how they are secured, either inherently through the project design, or through the implementation of a suitable DCO requirement, will be set out in the ES.

5.5 Monitoring

5.5.1 The EIA Regulations require "*the monitoring of any significant adverse effects on the environment of proposed development*". It is important to note that the Regulations only require the monitoring of significant adverse effects. The ES will therefore ensure that it is clear to the reader which, if any, effects are both adverse and significant and may therefore require monitoring.

5.5.2 It is important to note that Regulation 21 (3) of the EIA Regulations state that the SoS should:

(b) take steps to ensure that the type of parameters to be monitored and the duration of the monitoring are ***proportionate to the nature, location and size of the proposed development and the significance of its effects on the environment****; and*

(c) consider, in order to avoid duplication of monitoring, whether any existing monitoring arrangements carried out in accordance with an obligation under the law of any part of the United Kingdom, other than under the Directive, are more appropriate than imposing a monitoring measure.

5.5.3 Schedule 4 to the EIA Regulations identifies that an ES should identify "*any proposed monitoring arrangements*". The ES will therefore provide a schedule of proposed monitoring to clearly identify the monitoring that is proposed in relation to any significant adverse effects that have been identified. Any such monitoring will be proportionate, as noted above.

5.6 Preliminary Environmental Information Report (PEIR)

5.6.1 Under Regulation 12 (1)b of the EIA Regulations, the Applicant is required to set out how it intends to publicise and consult on preliminary environmental information relating to the proposed development. Regulation 12 (2) of the EIA Regulations then defines preliminary environmental information as being the information which has been compiled by the applicant, and is reasonably required for the consultation bodies to develop an informed view of the likely significant effects of the development (and of any associated development).

5.6.2 In the case of the proposed development, as set out in paragraph 5.2.2 above, PEIR will be published as part of the statutory consultation process which will be undertaken in accordance with the Planning Act 2008.

5.7 Environmental Statement

5.7.1 The EIA process will be documented in an ES which will describe the proposed development and set out the policy context; give full details of the EIA methodology and any technical methodologies and data used in support of the assessment; detail any mitigation and enhancement measures that have been employed; present the assessment of likely significant environmental effects and provide a schedule of proposed monitoring arrangements. The ES will present the residual effects, and an assessment of the cumulative effects and impact interactions as described in **Chapter 6** below.

5.7.2 In accordance with paragraph 9 of Schedule 4 to the EIA Regulations, a Non-Technical Summary (NTS) of the ES will also be provided.

5.8 Consideration of Alternatives

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

5.8.2 It is a matter for the developer to decide which alternatives it intends to consider. The EIA Regulations do not expressly require that an applicant considers alternatives, although it is widely encouraged at the policy level, both European and domestic, and is a feature of EIA best practice.

5.8.3 The ES will fulfil the requirements of the EIA Regulations through identifying the reasonable alternatives considered by the developer and explain the main reasons for the choices made.

5.9 EIA Team

5.9.1 Regulation 14 of the EIA Regulations requires that, to ensure the completeness and quality of environmental statements, *"the developer must ensure that the environmental statement is prepared by competent experts"*.

5.9.2 In accordance with Regulation 14, the ES will be accompanied by a statement from the

developer outlining the relevant expertise or qualifications of such experts.

5.9.3 **Appendix E** contains a table outlining the organisational experience of those who have contributed to this EIA Scoping Report and will contribute to the subsequent ES.

6 Proposed Scope of the EIA

6.1 Technical Scope

6.1.1 This technical scope describes the environmental topics that should be addressed by an EIA, in line with the requirements of the EIA Regulations. Schedule 4 sets out that the ES must include a description of the aspects of the environment which are likely to be significantly affected by the proposed development.

6.1.2 This requirement and the broad categories set out in Schedule 4, along with others which are considered to have the potential to lead to significant environmental effects, have been interpreted and applied in the context of the proposed development. **Table 6.1** therefore sets out those topics that it is proposed to scope into or out of the EIA. Note that in some instances particular aspects of a given topic are able to be scoped out. Where this is the case it is detailed within the separate topic sections set out in **Chapter 7**.

6.1.3 References are provided to demonstrate where these categories have been included within the EIA Scope. **Chapter 7** of this scoping report provides a detailed analysis of the resultant proposed technical scope of the EIA, while **Chapter 8** identifies the topic which is proposed to scope out of the EIA as it has been shown that significant environmental effects are unlikely to occur.

Table 6.1: Technical Scope

EIA Regulations Topic	Scoped in / Scoped out?	Explanation within this Scoping Report
Population	In	Section **7.2 – Transport** Section **7.12 – Socio-economics**
Human Health	In	Section **7.3 – Air Quality** Section **7.4 – Noise and Vibration** Section **7.10 – Hydrology, Flood Risk and Water Resources** Section **8.8 – Health**
Biodiversity (for example Flora and Fauna)	In	Section **7.7 – Terrestrial Biodiversity** Section **7.8 – Marine Biodiversity**
Land (for example land take)	In	Section **7.11 – Ground Conditions**
Soil (for example organic matter, erosion, compaction, sealing)	In	Section **7.10 – Hydrology, Flood Risk and Water Resources** Section **7.11 – Ground Conditions**
Water (for example hydromorphological changes, quantity and quality)	In	Section **7.7 – Terrestrial Biodiversity** Section **7.8 – Marine Biodiversity** Section **7.9 – Marine Geomorphology** Section **7.10 – Hydrology, Flood Risk and Water Resources**
Air	In	Section **7.3 – Air Quality**

EIA Regulations Topic	Scoped in / Scoped out?	Explanation within this Scoping Report
Climate	In	Section **8.3 – Climate Change**
Material assets	In	Section **7.6 – Historic Environment** Section **7.11 – Ground Conditions** Section **8.9 – Waste**
Cultural heritage, including architectural and archaeological aspects	In	Section **7.6 – Historic Environment**
Townscape	In	Section **7.5 – Townscape and Visual Impact Assessment**
The inter-relationship between the above factors	In	Section **7.13 – Summary and Impact Interactions**
The Risk of Major Accidents and/or Disasters	Out	Section **8.2 – Risk of major accidents and/or disasters**

6.1.4 The following paragraphs set out the principles for the temporal and spatial scope, and the approach to the assessment of effects, that will be applied to the EIA of the topics identified in **Chapter 7**.

6.2 Temporal Scope

Environmental Baseline

6.2.1 As a general principle, environmental effects will be assessed by comparing the predicted state of the environment without the proposed development, with the state of the environment with the proposed development for a particular year. This will include an outline of the likely evolution of the application site without implementation of the development as far as changes from the baseline scenario can be predicted (however the potential for this is limited given majority of the site comprises hard standing and due to the limited construction period of the proposed development).

6.2.2 The EIA will take into account approved developments that are likely to come forward during the construction of the proposed development and, where appropriate, these will be factored into the definition of the baseline or identified as receptors at a relevant point in time. Further details on the approach to approved developments are provided in **Section 6.4**.

Duration of Effects

6.2.3 Environmental effects will be classified as either permanent or temporary, as appropriate. Permanent changes are those which are irreversible (e.g. permanent landtake) or will last for the foreseeable future (e.g. emissions from generated road traffic).

6.2.4 The duration of temporary environmental effects will be defined as short, medium or long term based on the likely durations of the construction and operational phases of the development. These definitions will be considered within the assessment of the likely significant effects and will be set out in the ES.

6.2.5 Where environmental effects will be infrequent or intermittent (such as effects related to activities that will not be continuous during construction) this will be noted in the ES and the frequency of these activities will be considered in the assessment.

Construction

6.2.6 Certain environmental effects will only occur during construction of the proposed development and will cease once construction activities have completed. These will typically be the temporary effects of the proposed development and will be described as “short-term” or “medium-term”, as appropriate, using the definitions determined to be appropriate and set out in the ES. Examples include, but are not limited to:

- Creation of dust;
- Risk of pollution during construction; and
- Noise from construction activities.

Operation

6.2.7 Environmental effects that occur during the operation of REP will typically be permanent or “*long-term*”. Examples of permanent effects which might occur during the operation of REP include, but are not limited to:

- Changes to key views;
- Changes to the setting of heritage assets; and
- Changes to air quality from operational road traffic.

6.3 Spatial Scope

6.3.1 The spatial extent of each of the technical assessments will vary from one to another in accordance with the relevant policy and guidance for the assessment of that topic; in some instances the environmental effects will extend no further than the application site and in other cases the assessment will extend to a buffer beyond the application site. The study area for each technical assessment will be identified and described as appropriate in each of the topic chapters of the ES.

6.3.2 Chapters of the ES will assess sites and receptors of local, regional and national importance as appropriate, and in accordance with topic specific legislation and guidance.

6.4 Assessment of Effects

Types of Effects

6.4.1 In assessing the significance of effects identified during the EIA, account will be taken as appropriate as to whether effects are:

- Direct Effects – effects that are caused by activities which are an integral part of the proposed development (e.g. land take);
- Indirect Effects – effects arising indirectly from the construction or use of a development (e.g. supply chain effects in construction stage);
- Secondary Effects – are 'knock-on'/once-removed effects arising in consequence of indirect effects (e.g. the decision of firms to locate in a particular area following nearby transport infrastructure upgrades);

- Cumulative Effects – the cumulative effects of the proposed development and other approved local developments;
- In-combination Effects (impact interactions) - many effects that singly may not be significant, but when assessed together may be significant;
- Transboundary Effects – effects caused by a proposed development that are experienced across a boundary between European Economic Area states;
- Short-Term and Medium-Term – Environmental effects that occur during the construction of a proposed development will typically be Short or Medium Term;
- Long-Term – Environmental effects that occur during the operation of a proposed development will typically be Long Term;
- Temporary Effects – Environmental effects that occur during the construction of a proposed development will typically be temporary;
- Permanent Effects – Environmental effects that occur during the operation of a proposed development will typically be permanent;
- Beneficial Effects – effects that have a positive influence on the environment; and
- Adverse Effects – effects that have a negative influence on the environment.

6.4.2 For clarity within the assessment, 'impact' will be used in relation to the outcome of the proposed development (e.g. the removal of habitat or the generation of emissions to air), while the 'effect' will be the consequent implication in environmental terms (continuing the above example, e.g. the loss of a potential bird breeding site or the reduction in local air quality).

Residual Effects

6.4.3 The incorporation of mitigation measures, primarily as part of the proposed development design and construction phase, will be reported where appropriate and likely significant residual effects that remain will be described and assessed according to the significance criteria set out in **Table 6.2** below.

6.4.4 As noted above, the EIA Regulations require that the ES describes likely significant effects of the proposed development. However, there is no applicable definition of significance and interpretations differ. In accordance with the European Commission's Guidance on Scoping (2001), the EIA will study those effects that will influence decision-making or those where there is uncertainty about their magnitude. This approach is consistent with best practice for EIA in the UK.

6.4.5 The significance of an effect is typically the product of two factors, the value of the environmental resource affected and the magnitude of the impact, while consideration may also need to be given to the likelihood of an effect occurring. A significant effect may arise as a result of a slight impact on a resource of national value or a severe impact on a resource of local value. In addition, the accumulation of many non-significant effects on similar local resources geographically spread throughout the proposed development may give rise to an overall significant effect. An example of this might be the loss of ecological habitat of low value at many locations.

6.4.6 This approach to assessing and assigning significance to an environmental effect will rely upon such factors as legislative requirements, guidelines, standards and codes of practice, consideration of the EIA Regulations, the advice and views of statutory consultees and other interested parties and expert judgement. The following questions are relevant in evaluating the significance of likely environmental effects:

- Which risk groups are affected and in what way?
- Is the effect reversible or irreversible?
- Does the effect occur over the short, medium or long term?
- Is the effect permanent or temporary?
- Does the effect increase or decrease with time?
- Is the effect of local, regional, national or international importance?
- Is it a beneficial, neutral or adverse effect?
- Are health standards or environmental objectives threatened?
- Are mitigating measures available and is it reasonable to require these?

6.4.7 Specific significance criteria will be prepared as appropriate for each specialist topic, based on the above and the generic criteria set out in **Table 6.2** below.

Table 6.2: Significance criteria

	Significance Level	Criteria
Significant	Substantial	These effects are assigned this level of significance as they represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites and features of national or regional importance. A change at a district scale site or feature may also enter this category.
	Major	These effects are likely to be important considerations at a local or district scale and may become key factors in the decision-making process.
	Moderate	These effects, while important at a local scale, are not likely to be key decision-making issues.
Not significant	Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.
	Negligible	Either no effect or an effect which is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. Such effects should not be considered by the decision-maker.

6.4.8 Effects that are described as ‘substantial’, ‘major’ or ‘moderate’ are determined to be *significant*; and effects that are described as ‘minor’ or ‘negligible’ are determined to be *not significant* in the context of the EIA Regulations.

Consequential Effects

6.4.9 REP could result in consequential effects, in the form of increased vehicle movements servicing the Waste Transfer Stations (WTS) along the River Thames (which would supply waste by barge).

6.4.10 In gaining both the extant planning consents and Environmental Permits, throughput limits were imposed on each WTS. These limits would have been defined through appropriate impact assessment work, including consideration of impacts to the local road networks.

6.4.11 Each WTS would be restricted to operate within their approved limits and, as a result, vehicle movements servicing each WTS could not exceed the assessed limits.

6.4.12 As no un-assessed effects could occur to the road network surrounding each WTS, consequential effects from REP in this respect are not proposed to be included within the EIA.

Cumulative Effects and Impact Interactions

6.4.13 The EIA Regulations require the consideration of the potential impact of inter-relationships and cumulative effects of "existing and/or approved development" with the development.

6.4.14 The EIA will consider as appropriate:

- The likely significant cumulative effects of the proposed development and other major local existing and/or approved developments; and
- The potential for impact interactions leading to an aggregated environmental effect on a receptor being greater than each of the individual effects that have been identified (e.g. local people being affected by noise, dust and increased traffic levels during the construction of the development, where those impacts are greater combined than individually).

6.4.15 The assessment of likely significant cumulative effects of the proposed development and other local committed developments will be included within each of the topic chapters of the ES. The list of committed developments to be considered will be agreed in consultation with relevant stakeholders.

6.4.16 Potential impact interactions will be assessed within a dedicated chapter of the ES, as it will need to draw together the outcomes of individual discipline assessments.

Transboundary Effects

6.4.17 Regulation 32 of the EIA Regulations (Development with significant transboundary effects) applies where an ES is to be provided that, in the opinion of the SoS, shows the development is likely to have significant effects on the environment in another European Economic Area (EEA) State.

6.4.18 When this is the case, the SoS must consult with that EEA state and provide information on the description of the development, together with any available information on its possible significant effects on the environment, and information on the nature of the decision which may be taken.

6.4.19 It is not anticipated that the proposed development would result in significant transboundary effects due to the location and nature of the development. It is therefore considered that transboundary effects do not need to be considered within the ES.

Limitations, Uncertainty and Difficulties Undertaking the Assessment

6.4.20 The prediction of future effects inevitably involves a degree of uncertainty. Where necessary, the ES will describe the principal factors giving rise to uncertainty in the prediction of environmental effects and the degree of the uncertainty.

6.4.21 Confidence in predictions will be engendered by employing accepted assessment methodologies, e.g. Guidance for Ecological Impact Assessment by the Institute of Ecology and Environmental Management. Uncertainty inherent within the prediction will be described.

6.4.22 Uncertainty also applies to the success or otherwise of measures to mitigate adverse environmental effects. Where the success of a mitigation measure is uncertain, the extent of the uncertainty will be identified in the ES.

6.4.23 The ES will identify, in accordance with Schedule 4 of the EIA Regulations, any difficulties that have been encountered in undertaking the assessment.

7 Topics Included in the EIA Scope

7.1 Introduction

7.1.1 This chapter identifies the environmental topics scoped into the EIA, the potential effects and the methodology proposed to undertake the topic assessments. In some instances, the scope of the assessment is based on environmental information already collected (including collection of desk study data, site walkovers and previously conducted survey work) which is informing the emerging design of the proposed development.

7.2 Transport

Introduction

7.2.1 The purpose of the Transport chapter of the ES is to describe (and, where possible, quantify) the likely impact that the proposed development will have on the surrounding transport networks including the River Thames.

7.2.2 This chapter of the ES will be based on a Transport Assessment (TA) and will follow a scope that we will seek to agree with LBB and Transport for London (TfL). It is anticipated that this will include a full multi-modal impact assessment, which will consider the impact of the proposed development on all relevant transport infrastructure surrounding the application site.

7.2.3 An assessment of the proposed development's impacts during construction and operation on the river's capacity (in terms of level of service and level of safety) will be determined in a Navigational Risk Assessment (NRA) to be appended to the ES. The Transport ES chapter will draw on the outcomes of the NRA where relevant.

Baseline Conditions

7.2.4 This section will present the baseline conditions of the local transport infrastructure and networks in the area, comprising:

- RRRF site information
  - Existing plant, operating hours, equipment, parking, storage;
  - Staff information – shift patterns, staff numbers, mode share, postcode data;
  - Trip generation – vehicles and water freight via jetty, permitted trip generation; and
  - Trip distribution – staff postcodes, origins/destination of freight trips generated by RRRF.
- Highway network including TfL Road Network (TLRN) and the Strategic Road Network (SRN)
  - Existing traffic flow data – some collected by WSP in October 2015 and RPS in May 2016, but will need to be supplemented by Automatic Traffic Counts (ATCs) on local highway and more recent data should LBB and TfL consider the existing data to be outdated; and
  - Personal injury collision analysis (most recent 3-year data to be supplied by TfL).
- Public transport

- Rail (Belvedere), Elizabeth line (Abbey Wood); and
- Bus.

- Pedestrian network
- Cycle network
- River network including existing usage and capacity of the River Thames.

Potential Environmental Effects

Construction

7.2.5 Construction of REP will generate construction traffic and may require changes to access arrangements for RRRF. The impacts of construction traffic, including that resulting from site workers will be assessed. There may also be some impacts as a result of the Electrical Connection which would be considered where appropriate.

7.2.6 Any overlap in construction programme with the demolition / construction of other developments in the locality will also be assessed in terms of cumulative impacts. Potential transport-related environmental impacts during demolition / construction are likely to include:

- Impacts on users of the local road network (including drivers, cyclists and public transport) due to the movement of construction vehicles and temporary changes to local access arrangements;
- Impacts on other businesses and nearby properties due to increased vehicular traffic on the local highway network, and Norman Road in particular;
- Impacts on the level of service and level of safety for vessels operating on the River Thames, as caused by vessel trips generated during the construction phase as well as any works within the River Thames; and
- Impacts on pedestrians due to potential temporary closure of footways.

Operation

7.2.7 The majority of impacts are only likely to affect the immediate local area and delivery routes. The impact assessment will also consider the cumulative transport-related impacts from consented developments, to be agreed with LBB.

7.2.8 The main transport impacts during the operational phase are likely to be:

- Impacts on the local highway network that may arise due to increased vehicle trips to and from REP associated with both staff and material transport;
- Impacts on the level of service and level of safety for vessels operating on the River Thames, as caused by vessel trips generated during the operational phase;
- Impact on pedestrians and users of PRoWs; and
- Impacts on public transport resulting from additional staff trips.

Method

7.2.9 The assessment of individual environmental elements will be carried out drawing from the ‘Guidelines for the Environmental Assessment of Road Traffic’ (1993) published by the Institute

of Environmental Assessment (IEA), and where appropriate, Volume 11 of the 'Design Manual for Roads and Bridges' (DMRB) 'Environmental Assessment' (2008) published by the former Department of Environment, Transport and the Regions (DETR), now the Department for Transport (DfT). These documents are recommended tools for the appraisal of environmental impacts of transport and travel and they identify appropriate standards for assessment.

7.2.10 The IEA guidelines suggest two broad rules to identify the appropriate extent of the assessment area, as follows:

- Links with all vehicle or Heavy Vehicle traffic flow increases in any assessment year of +30%;
- Links with Medium or High sensitivity receptors with flow increases greater than 10%.

7.2.11 At this stage, it is not anticipated that many links will experience uplifts of more than 10% in either the construction or operational phases. However, the local highway network will be assessed in order to confirm this initial understanding.

7.2.12 The TA will set out the methodology for trip generation and distribution of REP vehicle and river freight trips. This will be based on a recommended best practice approach as set out within TfL's online transport assessment guidance. The assessment will draw from the observed trip characteristics of RRRF given that this represents a good existing dataset from which to determine likely effects of REP.

Assessment Scenarios

7.2.13 The assessment will consider the following scenarios:

- 2017 Baseline (Do Nothing);
- Construction peak year (Do Minimum);
- Opening Year plus 10 years (Do Minimum);
- Construction peak year (Do Something); and
- Opening Year plus 10 years (Do Something).

7.2.14 'Do Minimum' represents the 'without construction/development' scenario and 'Do Something' represents the 'with construction/development' scenario.

7.2.15 The years for peak construction and opening will be clarified during the assessment. Future year background traffic growth will be determined based on the DfT's traffic forecasting tool TEMPro.

7.2.16 Operational scenarios are to be quantified in terms of trip generation. Several modal splits between river and road freight will be assessed; however, to avoid repetition, a hypothetical worst-case assessment will be made in terms of the environmental impacts assuming 100% of waste being delivered by road as river freight trips have lower impacts on the environment. However, the proposal is being brought forward on the basis that it will achieve a model split by at least 75% by river.

Assessment Criteria

7.2.17 The IEA Guidelines will provide the assessment criteria for this study. The main transport impacts which could arise from REP would relate to the following:

- Severance;

- Driver Delay;
- Pedestrian Delay and Amenity;
- Fear and Intimidation;
- Accidents and Road Safety; and
- Dust and Dirt.

7.2.18 The 'Dust and Dirt' criterion, however, will not be considered within the Transport ES chapter, as this category will be covered within the Air Quality chapter of the ES.

Magnitude of Effects

7.2.19 A scale of magnitude will be outlined in the ES transport chapter. The magnitude of effects will be assessed against a scale divided into negligible, small, medium and large magnitude.

Sensitivity of Receptors

7.2.20 The sensitive receptors will comprise links and junctions of the local and strategic road network and PRoWs in the vicinity of the site, including pedestrian and cycle facilities such as footways and crossing points. The identified sensitive receptors will be rated in terms of their sensitivity on a scale of 'high', 'medium' and 'low'.

Table 7.2.1: Receptor Sensitivity

High Sensitivity	Medium Sensitivity	Low Sensitivity
▪ schools, colleges and other educational institutions (nurseries have been assumed to be included in this category) ▪ retirement / care homes for the elderly or infirm ▪ roads used by pedestrians with no footways ▪ road safety black-spots	▪ hospitals, surgeries and clinics ▪ parks and recreation areas ▪ shopping areas ▪ roads used by pedestrians with narrow footways	▪ open space ▪ tourist / visitor attractions ▪ historical buildings ▪ churches ▪ other roads with active frontages and dwellings

Significance of Effects

7.2.21 The significance of transport effects will generally be determined based on the magnitude of impact, receptor sensitivity and professional judgement. This is shown in the following table.

Table 7.2.2: Significance Matrix

		Sensitivity of Receptor		
		High	**Medium**	**Low**
Magnitude of Impact	**Large**	Substantial	Major	Moderate
	Moderate	Major	Moderate	Minor
	Small	Moderate	Minor	Minor
	Negligible	Negligible	Negligible	Negligible

Assumptions

7.2.22 There are limitations in the approach proposed to be taken in the TA and Transport chapter of the ES, with work being based on surveyed traffic flow data for selected time periods with data not collected throughout an entire year.

7.2.23 There will inevitably be variations to these surveyed flows, with each individual day presenting variances from the recorded flows. Notwithstanding this, such changes will not have a material impact on the findings of these assessments.

7.3 Air Quality

Introduction

7.3.1 The assessment will cover the impact of REP at the sensitive receptors in the environment during both the construction and operational phases.

7.3.2 Existing local air quality, the likely future air quality in the absence of REP, and the likely future air quality if the development goes ahead, will all be defined. The assessment of construction impacts will focus on the anticipated duration of works. The assessment of operational impacts will focus on the earliest year that the development is likely to be operational to provide a conservative assessment.

7.3.3 A human health risk assessment, to assess the risk to human health from potential emissions of persistent organic pollutants, will also be undertaken.

Baseline Conditions

Local Authority and Monitoring

7.3.4 The local planning authorities that cover the application site, depending on the final Electrical Connection route, include the LBB, LBBD, RBG and DBC. As part of Local Air Quality Management, the local authorities undertake monitoring of air quality within their areas, publishing the results in Annual Status Reports. In addition to the above local authorities, monitoring data from the London Borough of Havering will also be used in the assessment due to its close proximity to the site.

7.3.5 There are four monitoring stations that record concentrations of key pollutants using automatic analysers close to the REP site (less than 4 km). The automatic monitoring sites closest to the REP site are listed in the **Table 7.3.1** below:

Table 7.3.1: Automatic Monitoring Station

Site Name (ID)	X (m)	Y (m)	Local Authority
Belvedere Primary School (BX2)	549980	179064	London Borough of Bexley
Slade Green (BX1)	551864	176379	London Borough of Bexley
Scrattons Farm (BG2)	548043	183320	London Borough of Barking and Dagenham
Thamesmead (BX3)	547323	181231	The Royal Borough of Greenwich

7.3.6 In addition to these, the local authorities operate an extensive network of roadside diffusion tubes measuring nitrogen dioxide concentrations. This data will be reviewed and used in the assessment where there is the potential for cumulative impacts to occur at the monitoring locations.

7.3.7 The whole of LBB, LBBD and RBG were designated as AQMAs (Air Quality Management Areas) with respect to NO_2 and PM_{10}, in 2007, 2008, and 2001 respectively. Where an AQMA is designated, Local Authorities need to prepare Action Plans and work towards meeting the National Air Quality Strategy Objectives.

Receptors

7.3.8 The closest residential areas to the REP site are Belvedere Park to the south, Thamesmead to the west, and the proposed Beam Park development to the northeast. The impact of the development will be ascertained at specific receptor locations within these residential areas as well as locations where peak impacts occur.

7.3.9 In addition, the potential impacts of REP on designated ecological sites will be assessed. For emissions from the combustion plant on site, the screening distances set out in Environment Agency guidance will be used (https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit), being:

- 10 km for Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites;
- 2 km for Sites of Special Scientific Interest (SSSI) and local nature sites (ancient woods, local wildlife sites and national and local nature reserves).

7.3.10 For road traffic impacts, assessments will be undertaken where there is a modelled increase in traffic of more than 1,000 Annual Average Daily Traffic (AADT) on a road within 200 m of ecological habitats.

Cumulative Effects

7.3.11 The assessment will consider the other potentially significant sources of pollutants in the vicinity such as RRRF, Crossness Sewage Works, Beckton Sewage Works, East London Sustainable Energy facility in Rainham and Thames Gateway Waste to Energy. Apart from RRRF, the sources that are currently operational will be considered within the measurement of background concentration.

7.3.12 The impacts of REP and RRRF will be subject to dispersion modelling with both plants operating simultaneously. Possible future emission sources which have received planning consent will be reviewed for inclusion in the dispersion modelling.

Potential Environmental Effects

7.3.13 Given the existing conditions of the REP site, the construction and operation of REP has the potential to result in the following effects:

- Increased nitrogen dioxide (NO_2) and fine airborne particle (PM_{10} and $PM_{2.5}$) concentrations from road and river traffic during construction and operation;
- PM_{10} and dust impacts from construction;
- Odour impacts from the receipt and processing of waste;
- Increased pollutant concentrations from waste and gas combustion (gas resulting from anaerobic digestion);
- Increased deposition of metals to soil; and
- Increased NO_x concentrations, nitrogen, sulphur, hydrogen fluoride, ammonia and acid deposition on sensitive ecological receptors.

Method

7.3.14 The Air Quality and Health Assessment will be undertaken with the best available data relating to the operation of REP and a methodology that is consistent with current best practice for the assessment of air quality and human health effects. In general, conservative assumptions will be made regarding the treatment of the emission scenario and exposure of local people to the pollutants emitted. The methodology will be informed by consultation with the local Environmental Health Officers (EHO).

7.3.15 Existing local air quality will be defined within the study area drawing upon monitoring carried out by the Local Authorities in line with the information provided within each Council's Annual Status Reports.

7.3.16 Baseline data for NO_x, PM_{10}, $PM_{2.5}$, CO, SO_2 will be obtained from Defra background maps. Baseline data for other pollutants released will be obtained by reference to national inventories and monitoring networks. Other major applications in the area will be reviewed for baseline data.

7.3.17 Baseline nitrogen and acid deposition data for ecological habitats will be obtained from the APIS website.

Assessment of Combustion Effects

7.3.18 Emissions from the combustion processes within REP will be modelled using the ADMS 5 atmospheric dispersion modelling programme using 5 years' worth of hourly sequential meteorological data from London City Airport and Heathrow Airport. The proposed stack height will be chosen in accordance with Best Available Techniques and to support no significant environmental effects occurring as a result of combustion plant emissions.

7.3.19 Pollutant concentrations as a result of combustion emissions will be compared to National Air Quality Strategy objectives and Environmental Assessment Levels issued by the Environment Agency. Pollutant deposition rates will be compared to maximum deposition rates published by the Environment Agency. For the impacts on ecological sites, deposition rates will be compared

against site relevant critical loads for the habitats in question. The acceptability of the predicted concentrations and deposition rates will be in accordance with Environment Agency guidance.

7.3.20 In order to supplement the assessment of the impacts on air quality from the combustion processes, a human health risk assessment of the impacts of persistent organic pollutants will be undertaken in accordance with Environment Agency guidance.

Assessment of Road Traffic Effects

7.3.21 Air quality impacts arising from road and river traffic (during both construction and operation) will be assessed with reference to the guidance issued by the Institute of Air Quality Management (IAQM) and Environment Protection UK (EPUK) in their document: *Land-use Planning & Development Control: Planning for Air Quality January 2017*. Air quality will be assessed at the existing and approved residential properties closest to roads that might be affected by REP traffic. In particular, receptors closest to junctions where traffic emissions are greatest will be assessed.

7.3.22 The assessment of operational road and river traffic impacts will be undertaken using the ADMS Roads detailed dispersion model in accordance with the IAQM guidance. The model will be used to predict concentrations at worst case off-site receptors to assess the impacts of additional traffic associated with REP. Model outputs will be verified against local air quality monitoring locations. The modelling will make use of mapped background concentration data provided by Defra and of traffic flow projections. Traffic data will include committed development trip generation to take account of cumulative air quality impacts.

Assessment for Dust and Odour Effects

7.3.23 The potential impacts of construction dust will be assessed with reference to the IAQM's Guidance on the Assessment of Dust from Demolition and Construction (June 2016), which is accepted as industry standard guidance on this subject. There are no statutory objectives for dust; it is therefore common practice to provide a qualitative assessment based on the size of the site, regional meteorological conditions and experience of the distances over which impacts may occur. Air quality will be assessed at a range of worst-case receptors which are the existing and approved properties closest to the REP site.

7.3.24 The potential for adverse odour impacts from the receipt and processing of waste will be qualitatively assessed in accordance with IAQM 'Guidance on the assessment of odour for planning' and Environment Agency guidance on Environmental Permitting.

7.4 Noise and Vibration

Introduction

7.4.1 A noise and vibration assessment for the proposed development will consider likely significant noise and vibration impacts and effects caused by the construction and operation of the proposed development on noise sensitive receptors (NSRs) around the vicinity of the REP site and access routes.

Baseline Conditions

7.4.2 The closest NSRs to the REP site are located south of A2016. These include:

- Travelodge London Belvedere Hotel and nearby residences off Clydesdale Way;
- Hackney House, adjacent to A2016; and
- Properties along Norman Road (south), North Road and Poppy Close.

7.4.3 The other closest NSRs include those within the nearby settlement of Thamesmead.

7.4.4 Based on a desktop review of the REP site, the dominant noise source at these receptors is likely to be associated with road traffic along the A2016 Eastern Way.

Potential Environmental Effects

7.4.5 The key considerations in relation to the noise and vibration assessment are as follows:

- The effect of noise and vibration impact from fixed/mobile plant associated with the construction phase on nearby NSRs;
- Construction traffic effects on nearby NSRs; and
- The effect from the operational phase including plant and development traffic on nearby NSRs.

Method

7.4.6 Agreement on the assessment methodology will be sought from the EHO at LBB. Whilst the site boundary extends outside of LBB, the development in these areas is limited to the Electrical Connection route which would be underground. Therefore, noise impacts associated with this aspect of the development are not considered significant and would not be assessed further.

7.4.7 A baseline sound survey will be undertaken to establish the current baseline noise levels at locations representative of the NSRs. The location and duration of the sound survey will be agreed with the EHO at LBB.

7.4.8 The construction noise and vibration assessment will be undertaken following guidance in BS5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites.

7.4.9 The exact construction methodologies are unlikely to be defined until the full construction team is appointed, which is likely to be after the submission of the DCO application. However, in the absence of this data, an outline construction programme will be developed based on knowledge and experience of other similar developments, including RRRF. Additionally, the typical make-up of construction equipment will be ascertained in the same way. The quantification of impacts will be undertaken by comparison with relevant guidance and standards such as BS5228, or local legislative requirements. The assessment will outline suitable measures for the mitigation of construction impacts.

7.4.10 Operational noise from REP will be assessed using methodology defined in BS 4142:2014 *Methods for rating and assessing industrial and commercial sound*. The assessment will determine the rating level from REP operations and compare these to a baseline noise level at the closest NSRs. For significant effects, noise mitigation measures would be reviewed and specified in the chapter.

7.4.11 The assessment of operational noise will incorporate a desk-based 3D acoustic model using Soundplan modelling software. The acoustic model will be used to determine the noise levels at the nearest NSRs based on noise emission data for the proposed operations. The noise emission data will be collected through both relevant suppliers and measurements undertaken at RRRF.

7.4.12 It is proposed that the study area for the noise assessment of fixed plant associated with the operational effects will be defined as the region, within 1 km of the REP site. Traffic impacts would be assessed along road links extending further than this defined region with the extent depending on the outcome of the TA. The transport related assessment would determine the likely route of vehicles and assess appropriate road links with regards to change in noise levels.

7.4.13 Operational road traffic noise will be assessed using noise prediction procedures as detailed in the Department of Transport and Welsh Offices' 'The Calculation of Road Traffic Noise' (CRTN).

7.4.14 Noise levels will be predicted for both 'with' and 'without' development scenarios for an operational design year in line with the Transport Assessment, to allow the determination of the changes in road traffic noise at existing receptors as a result of REP. The significance of these changes will be based on guidance criteria contained in Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 – HD213/11 Noise and Vibration.

7.5 Townscape and Visual Impact Assessment

Introduction

7.5.1 This section sets out the proposed approach and methodology for undertaking a Townscape and Visual Impact Assessment (TVIA) for REP.

7.5.2 An overview of the townscape and visual baseline data that will be used within the TVIA is provided. Townscape/landscape designations and published townscape/landscape character assessments, which are relevant to the application site, are identified. The proposed viewpoints for the visual assessment and reasoning for their selection are also given. The scope of the TVIA is outlined, and potential likely significant effects identified.

7.5.3 This section considers the townscape and visual context of the Electrical Connection routes included within the application site. It should be noted however that the Electrical Connection, except at the point of connection, will be underground, therefore mitigating the potential for significant townscape or visual effects.

Baseline Conditions

Townscape / Landscape Designations

7.5.4 Townscapes may be valued at community, local, national or international levels. Existing townscape/landscape designations will be taken as the starting point for the TVIA, and the value of undesignated townscapes will also be considered where appropriate.

7.5.5 Relevant designations for the application site and surrounding area are set out in **Table 7.5.1**:

Table 7.5.1: Relevant Designations

Typical Designation and Importance (Value)	Description	Actual Designation Applicable to the Riverside Energy Park Main Site and Surrounding Area
World Heritage Site: International (High)	Unique sites, features or areas of international importance with settings of very high quality.	None on the application site. None within 5km.

Typical Designation and Importance (Value)	Description	Actual Designation Applicable to the Riverside Energy Park Main Site and Surrounding Area
Conservation Areas, curtilage of Grade I, II* and II Listed Buildings; Registered Parks and Gardens of Special Historic Interest (RHPG), Scheduled Monuments. National (High).	Sites, features or areas of national importance with settings of high quality.	The application site, including REP and two options for the Electrical Connection Route, do not lie in any Conservation area. The nearest Conservation Area to the REP site and Electrical Route Connection option 1 is Crossness Conservation Area, approximately 0.8km west, and which contains a number of listed buildings, for example: • Crossness Pumping Station and Workshop Range to South West of Main Engine House Crossness Pumping Station; • Electrical Connection Route Option 2 passes within 1km of to Lesney Park Road Conservation Area and Erith Riverside, Conservation Area of Erith and Oak Road Conservation Area of Slade Green;
		• Erith War Memorial, Christ Church, Erith Library, Parish Church of St John the Baptist are within the Conservation Areas mentioned above or close to the road A2016 which will be near Electrical Connection Route Option 2. There are no RHPGs within 5km of the application site. There are no Scheduled Monuments within the application site: • The nearest Scheduled Monument to the REP site is Lesnes Abbey, Bexley, 1.5km southwest; • A Scheduled Monument within 1km of the Electrical Connection Route Option 1 is a Burial mound on Winns Common, Plumstead, which is also situated 4.6km southwest of the REP site; • A Scheduled Monument Howbury Moated Site, 0.9km northeast offset from Thames Road, will be close to the Electrical Connection Route Option 2.
Long distance paths, London and National Cycle Routes Regional (High/ Medium)	Sites, features or areas of regional importance with intact character.	National Cycle Network (NCN) Route 1 connecting Dover and the Shetland Islands - via the east coast of England and Scotland passes along the northern boundary of the REP site and crosses the Electrical Connection Route Option 1 at Linton Mead Road near Thameside Walk. NCN Route 1 will meet and run with Electrical Connection Route Option 2 for a short length along Thames Road. A section of Electrical Connection Route 2 at Bob Dunn Way crosses beneath NCN Route 125.

Typical Designation and Importance (Value)	Description	Actual Designation Applicable to the Riverside Energy Park Main Site and Surrounding Area
Designated Public Open Space Local (Medium) or Regional (High or Medium)	Public open spaces, parks, recreational spaces.	The REP site does not lie in any Designated Public Open Space. The River Thames, Site of Metropolitan Importance for Nature Conservation (M031), is immediately north of the REP site; and Erith Marshes, Site of Metropolitan Importance for Nature Conservation (M041), forms the REP site boundaries to the west and south. Belvedere Dykes, Site of Borough Importance for Nature Conservation (BxB102), is along the east boundary of the REP site. Electrical Connection Route Option 1 will cross M031 and M041, and adjacent to Site of Importance for Nature Conservation (SINCs) BxL07, BxL16 and BxBII02. Electrical Connection Route Option 2 will be adjacent or close to SINCs BxB102, BxBII20, BxL10, BxBII14 and M106. An Area of Metropolitan Open Land, within Greenwich Borough lies 0.8km west of Electrical Connection Route Option 1. Also within Greenwich Borough there are areas of 'Community Open Space' along Carlyle Road, Western Way and Thamesmere, all with 1km of EC1. In the Borough of Bexley, there are areas of Public Open Space within 1km of EC1 to the north and south of Eastern Way. Along the route of EC2 , Frank's Park is designated Public Open Space and is situated 0.1km to the west of EC2. Other areas of Public open space within 1km of EC2, include recreational fields south of Frank's Park, and smaller pockets of space east and west of Queen's Road and South Road. In the Borough of Dartford the EC2 route follows the Bob Dunn Way where the Dartford Salt marshes lie north of the road.
Tree Preservation Orders (TPOs)	Protected trees within the Site or on the Site boundaries	None within the application site.

Townscape Character

7.5.6 Relevant townscape character descriptions for the REP site includes those published in:

- National Character Area Profiles (Natural England, 2013): **112: Inner London** and **81: Greater Thames Estuary**
- London's Natural Signatures: The London Landscape Framework (Natural England, 2011): **14: Lower Thames Floodplain**.

Views and Visual Amenity

7.5.7 Potential visual receptors include people who use the PRoW network and cycle routes, people using open spaces and parks, and people using the river corridor, road and rail network, who are visiting, living or working within the study area.

7.5.8 Following an initial review of the application site's context, preliminary proposed viewpoint locations for the assessment of visual effects upon people's views and visual amenity are set out in **Table 7.5.2** and on the Preliminary Viewpoint Location Plan at **Appendix F**. The exact positions of the viewpoint locations may be refined during the assessment process, or the viewpoint locations may be further scoped out where 'no views' of REP are identified during the assessment process. Where changes or further scoping out occurs, this will be documented in the TVIA chapter of the ES. No private views will be assessed in the TVIA.

Table 7.5.2: Proposed Representative Viewpoints for Visual Impact Assessment

Viewpoint Reference	Location	Reasoning for Selection
Sequential Views (to represent effects on the sequence of views when travelling along the route)		
SA-1-East	Thames Path National Trail and National Cycle Network Route 1 travelling eastwards, within 1km of Riverside ERF1	Thames Path National Trail; NCN 1
SA-1-West	Thames Path National Trail and National Cycle Network Route 1 travelling westwards, within 1km of Riverside ERF1	Thames Path National Trail; NCN 1
Representative Views (to represent specific views from a location)		
VP1	Public Right of Way southeast of RRRF	Public Right of Way
VP2	Public Right of Way between Crossness Nature Reserve and Thames Path National Trail	Public Right of Way
VP3	Public Right of Way in Crossness Nature Reserve	Public Right of Way
VP4	Public Right of Way between Crossness Nature Reserve and Eastern Road	Public Right of Way, road network
VP5	Public Right of Way off Picardy Manorway	Public Right of Way, road network
VP6	Public Right of Way at South Mere, west of Erith Marshes	Public Right of Way, part of public open space network
VP7	St. Andrews Close, Thamesmead	Settlement at river edge, near to Thames Path National Trail
VP8	Lesnes Abbey	Scheduled monument, Public Right of Way, public open space network
VP9	Halt Robin Road at northwestern corner of Franks Park, near to Wood Side School	Road network, Green Chain Walk long distance route, access to / from public open space
VP10	Ferry Lane, between Frog Island and Jetty	London Loop long distance route, NCN 13
VP11	Public Right of Way, west of Horse Shoe Corner	Public Right of Way
VP12	Thameside Walk / Thames Path National Trail, northwest of Thamesmere Leisure Centre	Public Right of Way

Viewpoint Reference	Location	Reasoning for Selection
VP13	Roundabout at junction of A202, A2016, Walnut Tree Road and Bexley Road	Road network access to London Loop footpath route
VP14	Barnes Clay	NCN 1 and Public Rights of Way
VP15	Bridleway west of Littlebrook Nature Park	Public Right of Way and public open space network

Potential Townscape and Visual Effects

7.5.9 Potential townscape and visual effects arising from REP are those upon:

- Townscape features;
- Townscape character; and
- People's views and visual amenity.

Townscape Features of the Site

7.5.10 Townscape features of the REP site which will potentially be affected by the proposals include:

- Trees and existing vegetation, boundary treatments and existing hardstanding areas – removal and replacement by new development and replacement landscape planting;
- Urban grain, massing and scale – demolition of existing hardstanding areas, changes to the internal layout, scale of new buildings in context with adjacent buildings; and
- Change to sense of place arising from new buildings, new frontages, structures, site layout, and new landscape planting.

Townscape Character

7.5.11 It is likely that positive or neutral changes will occur to the REP site's townscape character, arising from the new site layout, buildings and structures, and potential new landscape planting within the wider industrial and riverside townscape character.

People's Views and Visual Amenity

7.5.12 Adverse changes to views are likely to arise during the construction period as a result of views of cranes and other construction plant at the REP site; and less visable works to install the Electrical Connection route. There are likely to be adverse changes to local views at operation as a result of the changes to buildings and structures in the townscape; and adverse or neutral changes to medium and long distance views as a result of the new buildings including a stack seen within the urban context.

Method

7.5.13 The proposed methodology for the TVIA is based on professional experience, the Landscape Institute / Institute of Environmental Management and Assessment 'Guidelines for Landscape and Visual Impact Assessment' (3rd Edition, 2013) and Transport Analysis Guidance (WebTAG) Chapter 7: Impacts on Townscape, TAG Unit A3 Environmental Impact Appraisal (December 2015). In addition, the methodology will be based upon Landscape Institute Advice Note 01/11

'Photography and photomontage in landscape and visual impact assessment' (LI, 2011). The TVIA will consider the effects on townscape (including townscape character) and people's views / visual amenity as separate assessment components.

7.5.14 The assessment of townscape and visual effects will make comparison with the baseline year of 2017, and will include assessment during the construction period and on completion of the development (i.e. operation). Where appropriate, for example for local views of the REP site, the visual assessment will include a period of 15 years after completion of the development, when any mitigation required has successfully established and settled.

7.5.15 A Zone of Theoretical Visibility (ZTV) plan will be created based upon the final plans for REP. The ZTV will show the theoretical extent of the area from which REP is likely to be visible. It is important to note that the ZTV will demonstrate the worst-case scenario; and that, in reality, other built form and other features, such as hedgerows or street trees, are likely to provide additional filtering or reduction of views.

7.5.16 Background data will be collected and reviewed to confirm baseline townscape and townscape character information, including topography, townscape planning designations and published sources of townscape character or, where relevant, landscape character. The REP site and surrounding area will be visited to carry out the assessment of townscape and visual effects and to prepare a photographic record to represent the 2018 baseline views from the selected assessment viewpoints.

7.5.17 A three-stage assessment process will be adopted for the TVIA, in accordance with the Landscape Institute/Institute of Environmental Management and Assessment guidelines. Firstly, the nature of receptors (sensitivity) will be assessed. Secondly the nature of effects (magnitude) likely to result from REP will be assessed. Lastly, the significance of the identified townscape and visual effects on receptors will be assessed, as required by the European Union Directive 2011/92/EU and UK Country Regulations.

Assessment of Townscape Effects

7.5.18 This will assess how REP will affect the components of the urban environment (for example: scale, street trees / landscape planting, urban grain and massing, legibility, public realm), and the key characteristics which contribute to its distinctive character (the 'townscape character').

7.5.19 A methodical consideration of each effect upon each identified townscape receptor will be undertaken, in order to determine the significance of effects, as a combination of the sensitivity of the landscape receptor the magnitude of the landscape effect.

7.5.20 The value of potentially affected townscape receptors will be assessed, including townscape character and the individual elements or features which contribute to that townscape character. Susceptibility of townscape receptors to change arising from REP is a judgement of the ability for REP to be accommodated without undue consequences for the maintenance of the baseline townscape and/or the achievement of townscape regeneration planning policies and strategies.

7.5.21 The assessment of townscape receptor sensitivity will combine judgements on the 'value' attributed to the townscape receptor and the 'susceptibility to change' of that receptor to the specific type of development proposed.

7.5.22 The magnitude of a townscape effect will be assessed in terms of its size or scale, the geographical extent of the area influenced and its duration and degree of reversibility.

Assessment of Effects on People's Views and Visual Amenity

7.5.23 This will assess how REP will affect the views available to people and their visual amenity. A methodical consideration of visual effects upon each identified visual receptor will be undertaken in order to determine the significance of effects, as a combination of sensitivity of the visual receptor, or viewer and magnitude of the visual effect.

7.5.24 The assessment of visual receptor sensitivity will combine judgements on the value attributed to the visual receptor and the 'susceptibility to change' of the receptor to the specific type of development proposed. The value assigned to views will have regard to a number of factors, including recognition through planning or heritage assets and/or the popularity of the viewpoint, its appearance in guidebooks, literature or art, on tourist maps, and the facilities provided to enable enjoyment of the view. Susceptibility of people to changes in views is a function of the occupation or activity of the view at a given location and the extent to which a person's attention or interest may therefore be focussed on a particular view, and the visual amenity experienced.

7.5.25 The magnitude of a visual effect will be assessed in terms of its size or scale, the geographical extent of the area influenced and its duration and degree of reversibility.

Townscape and Visual Mitigation Measures

7.5.26 Embedded mitigation measures and standard construction and operational management practices, proposed for preventing/avoiding, reducing or, where possible, offsetting or compensating for significant adverse landscape or visual effects, will be described in the TVIA and the project description in the ES.

7.5.27 Further townscape and visual mitigation measures, if required, will be described in the TVIA.

Assessment of Significance of Townscape and Visual Effects

7.5.28 Significance of townscape and visual effects vary with the location, townscape context and type of proposed development.

7.5.29 The significance of townscape and visual effects will be determined from a combination of the receptor sensitivity and the magnitude of effects, as set out in the following table. Minor and negligible levels of significance are identified as 'not significant'.

Table 7.5.3: Level of Significance of Townscape and Visual Effects

Sensitivity of Receptor	Major Effect	Moderate Effect	Slight Effect	Negligible Effect	Neutral Effect
High	**Severe** or **Major to Severe**	**Major**	**Moderate**	Minor	Negligible
Medium	**Major**	**Moderate**	Minor	Negligible	Negligible
Low	**Moderate**	Minor	Minor	Negligible	Negligible

7.5.30 A severe level of significance is assigned where a landscape or visual effect represents a key factor in the decision-making process. These effects are generally, but not exclusively, associated with altering the integrity of sites and features of national or regional importance. A change at a district scale site or feature may also enter this category, though this is subject to professional judgement and will be proportional to the type and extent of development that is being assessed. Where there is a combination of receptor high sensitivity and a major effect, professional judgement may be applied to determine a 'major to severe' level of significance where it is considered that the effect does not represent a key factor in the decision-making process or where the development will have limited effects such that it will not alter the integrity of sites and features of national or regional importance.

7.5.31 The above table has regard to guidance in the Guidelines for Landscape and Visual Impact Assessment, (3rd Edition, 2013), at paragraph 5.56, page 92 (significance of landscape effects) and paragraph 6.44, page 116 (significance of visual effects).

7.6 Historic Environment

Introduction

7.6.1 The Historic Environment chapter will consider the potential physical and non-physical effects of the proposed development upon known and potential designated and non-designated heritage assets. The Historic Environment chapter will incorporate the results of an archaeological Desk Based Assessment (DBA) and a Geo-archaeological Statement by QUEST.

Baseline Conditions

7.6.2 The REP site contains no known designated or non-designated heritage assets. An understanding of the baseline conditions for this area have been informed by the following intrusive archaeological investigations within or immediately adjacent to the REP site:

- Geotechnical monitoring at the former Belvedere Power Station on Norman Road, Bexley (Lawson-Price Environmental 2004);
- A nine trench archaeological evaluation completed in advance of the construction of the RRRF power plant (Pre-Construct Archaeology 2008) and subsequent deposit modelling which included borehole data from the jetty area (Batchelor *et al* 2008);
- Geoarchaeological deposit model of the Crossness site in Erith which included the western part of the site (QUEST 2011) and geoarchaeological deposit model of Burts Wharf, 200m east of the site (QUEST 2016). This provides an existing and informed baseline for the REP site. As such, this area is considered to have the potential to contain non-designated prehistoric / paleoenvironmental remains of local significance. Should such deposits be present, they are likely to be relatively deeply buried and associated with below ground deposits of peat and gravel and comprise deposits which have the potential to contain further information on the past landscape, through the assessment/analysis of palaeoenvironmental remains (e.g. pollen, plant macrofossils and insects) and radiocarbon dating. The archaeology of the river bed will also be considered should the final design require localised dredging of the river bed as part of the proposed river works.

7.6.3 Land within the application site along Norman Road, to the west of Norman Road and land to the east of the REP site contains no known designated or non-designated heritage assets. This area has not been subject to previous intrusive investigation, however the aforementioned investigation informs the potential for this area. There is potential for non-designated prehistoric / paleoenvironmental remains of local significance within this area of the REP site.

7.6.4 The Electrical Connection route Option 1 to the north west contains no designated heritage assets. This route currently crosses greenfield areas (including 20th century parkland at Thamesmead (GLHER MLO103664)), existing road, under the Thames and around the edge of the Barking Power Station. The final assessment of this area is awaiting confirmation from UKPN of which Electrical Connection route is to be taken forward.

7.6.5 The Littlebrook Power Station Electrical Connection route Option 2 contains no designated heritage assets. This route primarily respects the line of existing roads and therefore the potential for well-preserved deposits of archaeological interest is negligible. However, final assessment of this area is awaiting confirmation of which Electrical Connection route is to be taken forward.

7.6.1 There are no scheduled monuments, registered parks and gardens, battlefields, World Heritage Sites or shipwrecks within 1 km of the REP site that could be significantly affected by the proposed development. The Crossness Conservation Area, located approximately 800 m to the west of the REP site, is a mid-Victorian example of public health engineering with a unique

industrial complex. It is South East London's most important site for industrial archaeology. The key elements that characterise the Conservation Area are the Grade I Listed Crossness Pumping Station comprising the Beam Engine House, Boiler House and Triple Expansion House; the Grade II Listed workshops; and the brick vaulted subterranean reservoir. Other significant buildings include the storm water pumping station/cent. There is a single late 19th/early 20th century Grade II listed coaling jetty on the north bank of the River Thames in Dagenham.

Potential Environmental Effects

Construction effects

7.6.2 Construction effects would largely comprise physical impacts upon below-ground non-designated archaeological remains. Such effects may arise from the foundations of new buildings, landscape works, changes to hydrological conditions and requirements such as trenches for new utilities and services. Proposed river works for construction may also include some localised dredging of the river bed.

7.6.3 The construction effects of the electrical connection to either Barking or Littlebrook Power Station substations, will be considered in the ES chapter following confirmation of the chosen Electrical Connection route.

Operational effects

7.6.4 REP could theoretically have an effect on the setting of the Crossness Conservation Area and its associated three listed buildings and the setting of the coaling jetty on the north bank of the Thames. However, given the nature of the designated remains and the nature of their setting and existing developments in the vicinity of the REP site, the effect on the significance of these designated heritage assets are considered most likely to be low or non-existent.

7.6.5 The underground Electrical Connections to either Barking or Littlebrook Power Station substations will not affect the setting of heritage assets, and therefore these operational effects are proposed to be scoped out of the EIA.

Method

7.6.6 The Historic Environment chapter will incorporate the results of an archaeological DBA and a Geoarchaeological Statement by QUEST.

7.6.7 The DBA will identify and characterise known and potential heritage assets sensitive to impact by REP. The following sources will be consulted to inform the heritage baseline:

- A search of the Greater London Historic Environment Record (GLHER) for known non-designated historic/archaeological remains within 1 km of the application site boundary;
- Designated assets (scheduled monuments, listed buildings and Registered Parks and Gardens) obtained from Historic England;
- Areas of importance identified in local planning policy (conservation areas, archaeological priority areas); and
- Cartographic and documentary research. Heritage planning policy from LBB, LBBD, RBG and DBC (dependant on the Electrical Connection).

7.6.8 In light of the previous geoarchaeological works within and adjacent to the REP site, the Historic Environment chapter will incorporate the results of a Geoarchaeological Statement by QUEST. At this stage it is likely that a DBA of potential geoarchaeological impacts will suffice, using historic borehole data from the site and surrounding area. The assessment will identify

areas where additional borehole data is required and make recommendations for further work, if required. On-going liaison regarding proposed geotechnical works will be undertaken.

7.6.9 Determination of the importance of heritage assets is based on existing statutory designations and, for non-designated archaeological assets, the Secretary of State's non-statutory criteria and professional judgement.

7.6.10 Using this approach, the criteria for establishing the importance of a heritage assets is described in **Table 7.6.1** below.

Table 7.6.1: Determining the Importance of a Heritage Asset.

Importance	Description
International	Archaeological sites or monuments of international importance, including World Heritage Sites. Structures and buildings inscribed as of universal importance as World Heritage Sites. Other buildings or structures of recognised international importance.
National	Ancient monuments scheduled under the Ancient Monuments and Archaeological Areas Act 1979, or archaeological sites and remains of comparable quality, assessed with reference to the Secretary of State's non-statutory criteria. Listed Buildings. Non-designated built assets of national importance, assessed with reference to the Secretary of State's published Principles of Selection for Listing Buildings.
Regional/ County	Archaeological sites and remains which, while not of national importance, score well against most of the Secretary of State's criteria Conservation Areas.
Local	Archaeological sites that score less well against the Secretary of State's criteria. Historic buildings on a 'local list'. Non-designated built assets of local significance.
None	Areas in which investigative techniques have produced negligible or only minimal evidence for archaeological remains, or where previous large-scale disturbance or removal of deposits can be demonstrated.

7.6.11 The Historic Environment chapter of the ES will identify and evaluate the nature and likelihood of the impacts of REP, in both the long and short term, on archaeological and heritage features against clearly defined criteria.

7.6.12 Significance will be assigned to effects relative to the sensitivity of the resource and the magnitude of impact in accordance with best practice.

7.6.13 Archaeological resources are susceptible to a range of impacts during site preparation as well as construction related activities, including:

- Site clearance activities that disturb archaeological remains;

- Excavation that extends into archaeological sequences, for example deep foundations or basements resulting in the removal of the resource;
- Piling activities resulting in disturbance and fragmentation of the archaeological resource; and
- Dewatering activities resulting in desiccation of waterlogged remains and deposits.

7.6.14 The implications, if any, of these actions will be discussed and significance criteria allocated to any identified impact.

7.6.15 In terms of the impacts on built cultural heritage, the impacts of the development can be direct, such as loss or damage to a heritage features, or indirect, including the impact on the setting of a Listed Building. Any such impacts will be discussed and significance criteria applied. The significance of effects will be assessed using the significance criteria set out below.

Magnitude of Impact

7.6.16 Determining the magnitude of impact is based on an understanding of how, and to what extent, REP would impact heritage assets.

7.6.17 The magnitude of the impact is a product of the extent of development impact on an asset. Impacts are rated as High, Medium, Low and Negligible/Neutral. Impacts can be direct or indirect, adverse or beneficial. The criteria for assessing the magnitude of impact are set out in **Table 7.6.2** below.

Table 7.6.2: Magnitude of Impact.

Magnitude	Direct Impacts	Indirect Impacts
High Adverse	Demolition of built heritage assets or demolition within a Conservation Area. Complete removal of an archaeological site.	Radical transformation of the setting of an archaeological monument. Substantially harmful change in the setting of a built heritage asset or Conservation Area.
Medium Adverse	Harmful alteration (but not demolition) of a built heritage asset or alterations to a building in a Conservation Area. Removal of a major part of an archaeological site and loss of research potential.	Less than substantial harm to the setting of a built heritage asset or Conservation Area. Partial transformation of the setting of an archaeological site e.g. the introduction of significant noise or vibration levels to an archaeological monument leading to changes to amenity use, accessibility or appreciation of an archaeological site.
Low Adverse	Alterations to a built heritage asset or Conservation Area resulting in minor harm. Removal of an archaeological site where a minor part of its total area is removed but the site retains a significant future research potential.	Minor harm to the setting of an archaeological monument or built heritage asset or Conservation Area.

Magnitude	Direct Impacts	Indirect Impacts
Negligible/ Neutral	Negligible impact from changes in use, amenity or access. Negligible direct impact to the built heritage asset or Conservation Area.	Negligible perceptible change to the setting of a building, archaeological site or Conservation Area.
Low Beneficial	Alterations to a built heritage asset or Conservation Area resulting in minor beneficial impacts. Land use change resulting in improved conditions for the protection of archaeological remains.	Minor enhancement to the setting of a built heritage asset or Conservation Area. Decrease in visual or noise intrusion on the setting of a building, archaeological site or monument.
Medium Beneficial	Alterations to a built heritage asset or Conservation Area resulting in moderate beneficial impacts.	Significant reduction or removal of visual or noise intrusion on the setting of a building, archaeological site or monument. Improvement of the wider landscape setting of a built heritage asset, Conservation Area, archaeological site or monument.
	Land use change resulting in improved conditions for the protection of archaeological remains plus interpretation measures (heritage trails, etc.)	Improvement of the cultural heritage amenity, access or use of a built heritage asset, archaeological site or monument. Moderate enhancement to the setting of the built heritage asset and Conservation Area.
High Beneficial	Arrest of physical damage or decay to a built heritage asset or structure. Alteration to a built heritage asset or Conservation Area resulting in significant beneficial impact.	Significant enhancement to the setting of a built heritage asset. Conservation Area or archaeological site, its cultural heritage amenity and access or use.

Significance of Impact

7.6.18 The significance of the impact of REP on archaeological and heritage assets is determined by the importance of the asset and the magnitude of impact to the asset. **Table 7.6.3** below presents a matrix that demonstrates how the significance of Effect will be established:

Table 7.6.3: Evaluation of Significance

Magnitude of Impact	High	Medium	Low	Negligible / Neutral
International Importance	Substantial/ Major	Major	Major	Negligible
National Importance	Major	Major/ Moderate	Moderate	Negligible
Regional/County Importance	Major/ Moderate	Moderate/ Minor	Minor	Negligible
Local Importance	Minor	Minor	Negligible	Negligible
Negligible Importance	Negligible	Negligible	Negligible	Negligible

7.6.19 The means by which impacts can be avoided through design will be explored as a priority. If impacts cannot be avoided through design, then alternative strategies, which may include site investigation and recording, will be proposed. The residual effects following the implementation of these measures will then be defined and significance criteria applied.

7.7 Terrestrial Biodiversity

Introduction

7.7.1 This section provides an overview of the scope of terrestrial biodiversity issues likely to require consideration within the Terrestrial Biodiversity chapter of the ES, in order to assess likely significant effects on Terrestrial Biodiversity as a result of REP.

7.7.2 A walkover survey of the REP site was undertaken in September 2017, by an experienced ecologist, during which the broad habitat types were identified. An extended Phase 1 habitat survey of the application site will be undertaken, which in turn will inform the scope of any targeted habitat and species surveys to be undertaken between autumn 2017 and autumn 2018. Wintering bird surveys of the mudflat habitat immediately adjacent to the REP site are already in progress, due for completion in March 2018. The survey extent includes sections of mudflat habitat upstream and downstream of the REP site (up to 1.8 km and 1.25 km from the REP site, respectively), in order to allow consideration of the bird data obtained immediately adjacent to the REP site in the context of the wider surrounds.

7.7.3 The Terrestrial Biodiversity chapter of the ES will set out an assessment of the likely ecological effects associated with REP and the mitigation and/or compensation required to ameliorate any effects and demonstrate that REP will be in accordance with legislation and planning policy.

Baseline Conditions

Designated Areas

7.7.4 A number of nationally designated areas of nature conservation interest are located within 2 km of the application site. The closest of these is the Inner Thames Marshes Site of Special Scientific Interest (SSSI), located approximately 1.4 km north-east of the closest part of the application site. The Inner Thames Marshes sits on the opposite side of the River Thames to REP. Rainham Marshes Local Nature Reserve (LNR) also falls within the westernmost extent

of the SSSI designation. The marshes are the largest remaining expanse of wetland bordering the upper reaches of the Thames Estuary. The SSSI is of particular note for its diverse ornithological interest, especially for the variety of breeding birds and the numbers of wintering wildfowl, waders, finches and birds of prey; wintering teal populations reach levels of international importance. The Marshes also support a wide range of wetland plants and insects with a restricted distribution in the London area, including some that are nationally rare or scarce.

7.7.5 Crossness LNR is located immediately adjacent to the western and southern boundaries of the REP site and is the closest LNR to the Indicative Application Boundary. Crossness LNR forms part of a wider Site of Metropolitan Importance for Nature Conservation (Erith Marshes) and is owned and managed by Thames Water. Combined, these designated areas form one of the last remaining areas of grazing marsh in Greater London, and the largest reedbed in Bexley. Other habitats present include a network of ditches and open water, scrub and rough grassland. It is a major site for water voles, and over 130 species of birds have been recorded there, together with some rare invertebrates, including five species of water beetles. Scarce plants known to occur within the area include knotted-hedge parsley and Borrer's saltmarsh grass.

7.7.6 Abbey Wood SSSI is located 1.5 km to the south west of the closest part of the application site. The SSSI designation relates to the area's geological, as opposed to biological, interest. However, the wider Abbey Woods, including the SSSI element, is designated as a LNR (i.e. Lesnes Abbey Woods LNR). Comprising extensive ancient woodland and surrounding parkland, Lesnes Abbey Woods is noted for its diverse range of wildlife habitats, plants and flowers. Lesnes Abbey Woods is the second largest park in the LBB and is also afforded a non-statutory designation as a Site of Metropolitan Importance for Nature Conservation.

7.7.7 Other statutory designated sites beyond those described above but which lie within 2 km of the application site include: Purfleet Chalk Pits SSSI and West Thurrock Lagoon and Marshes SSSI, both sites lie within 1.5-2km of the Indicative Application Boundary, with the closest part of the application site being the eastern Electrical Connection route. In addition, Ripple LNR and Scrattons Ecopark and Extension LNR also lie just under 2 km from the application site, with the closest part of the application site being Electrical Connection route Option 1.

7.7.8 The River Thames, north of the REP site, is also afforded a non-statutory designation, namely The River Thames & tidal tributaries Site of Metropolitan Importance. The designation comprises the whole of the river and its tidal tributaries within the boundary of Greater London. As well as the river channel itself, habitats within the Site of Metropolitan Importance include mudflats, shingle beach, inter-tidal vegetation, islands and the river banks.

7.7.9 There are no European designated areas within 10 km of the REP site, with the closest being Epping Forest Special Area of Conservation (SAC), located approximately 12 km from the REP site; this SAC lies just over 9 km from Electrical Connection route Option 1.

7.7.10 As referred to in the Air Quality section above, the potential impacts of REP on designated ecological sites will be assessed. For emissions from the combustion plant on site, the screening distances set out in Environment Agency guidance will be used (https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit):

- 10 km for SACs, SPAs and Ramsar sites; and
- 2 km for SSSIs and local nature sites (ancient woods, local wildlife sites and national and local nature reserves).

7.7.11 Owing to the distance of the SAC from the REP site, significant indirect effects relating to air quality changes are considered unlikely on Epping Forest SAC (refer to Air Quality section above). However, the consideration of indirect impacts on Epping Forest SAC within the Biodiversity chapter of the ES, and the need for separate Habitat Regulations Assessment Screening, will be discussed and agreed with Natural England as statutory consultee.

7.7.12 Further information on designated areas will be obtained from Greenspace Information for Greater London (GiGL) as part of a detailed desk study review in order to establish the location and designation criteria of other non-statutory designations within the vicinity of the REP site.

Habitats

7.7.13 A walkover survey of the REP site undertaken by an experienced ecologist confirmed it to be dominated by man-made and modified habitats, some of which are of biodiversity interest. An embankment of semi-improved neutral grassland, seeded in 2011, forms the northern boundary of this area. This is proposed to be largely retained as part of REP. Existing non-designated Wasteland Habitat Area (WHA) is located within the central area of the REP site. The WHA, which was implemented approximately six years ago as part of the adjacent RRRF development, comprises a mosaic of tussocky grassland and bare ground (exposed rock), interspersed with introduced shrub planting such as buddleia and pampas grass, as well as scattered young deciduous trees. Stands of dense bramble scrub and young plantation woodland are also present in the south of the REP site. Remaining habitats within the REP site are dominated by hardstanding used for car parking and collections of temporary use buildings and structures (containers and cabins), as well as modern, large sheds. Sections of ditch form the southern and western boundaries of the area, which are dominated by common reed. These ditches connect with a wider network of ditches located within Crossness LNR.

7.7.14 Habitats within the application site, with the exception of the area within the Indicative Application Boundary shown within grassland habitats of Crossness LNR, are again largely man-made / highly modified and comprise existing roads / roadside hardstanding and developed areas.

7.7.15 A full extended Phase I habitat survey of the REP site and all areas within the application site will be undertaken to confirm the distribution and biodiversity value of all the habitats within the future application boundary.

Protected and Notable Species

7.7.16 Existing information on Protected and Notable Species will be obtained from Greenspace Information for Greater London (GiGL) as part of a detailed desk study review in order to establish the known records of any such species within or near to the REP site. The desk study, along with the results of the extended Phase 1 habitat survey, will guide the scope for further targeted species and habitat surveys necessary to confirm the current ecological baseline for the REP site.

7.7.17 The scope of further survey work will also be guided by the nature of the development proposals, focussing survey effort on those ecological features potentially affected by REP. Further information regarding the likely scope of targeted species and habitat surveys is provided in **Table 7.7.1** below.

Table 7.7.1: Likely Scope of Baseline Ecological Survey Work

Ecological Feature	Survey Approach
Terrestrial Habitat Survey	Extended Phase 1 habitat survey of the application site, including recording of locations of Invasive Non Native Species.
Over-Wintering Birds	The REP site lies adjacent to the River Thames Site of Metropolitan Importance, noted, in part, for its bird interest. Wintering bird surveys (i.e. monthly high and low tide counts) are being undertaken to determine the importance and use of the adjacent mudflat habitats by wintering birds associated with the River Thames. The outcome of the surveys will inform assessment of the importance of the adjacent mudflat habitats by wintering birds, and the likelihood of indirect effects as a result of REP. The survey also considers mudflat habitat suitable for wintering birds within 1.8 km

Ecological Feature	Survey Approach
	upstream and 1.25 km downstream of the REP site. Survey work is being undertaken between October 2017 and March 2018. The survey scope may be extended dependent on the final redline and development proposals.
Breeding birds	Breeding bird transect surveys will be undertaken between March 2018 and June 2018 for the REP site location (as a minimum) and any other relevant parts of the proposal, to be confirmed based on the final application boundary, results of the extended Phase 1 habitat survey and consideration of potential impacts of the proposed development. The survey will determine the diversity and breeding territories of breeding birds within the REP site.
Water vole survey (presence/absence)	A water vole survey (presence/likely absence) will be undertaken if applicable, dependent on the final application boundary and occurrence of suitable habitat within it. Suitable waterbodies / ditches will be surveyed twice, in spring and then later summer 2018.
Badger survey	The application site and immediate surroundings will be surveyed for badger activity as part of the extended Phase 1 habitat survey.
Bat survey	A Preliminary Roost Appraisal of trees and structures within the REP site will be undertaken as part of the extended Phase 1 habitat survey and will determine whether or not there are roosting features which may then require emergence/return surveys of buildings (spring/summer 2018) and/or aerial inspection of trees. General bat foraging or commuting activity will be determined for the REP site through transect and static detector recording sessions over the period May-September 2018 inclusive.
Reptiles	The REP site, and areas within the application site, provide opportunities for low numbers of common and widespread reptile species. A presence / likely absence reptile survey of the REP site, and other suitable habitat in the application site (if appropriate), will be undertaken in spring 2018 (March-June).
Invertebrates and targeted botanical survey	Dependent on the application boundary, it may be appropriate to complete targeted surveys for invertebrates and botanical interest in spring / summer 2018. The principal invertebrate and botanical interest is likely to be associated with Crossness LNR. However, given the focus of the development within this area will be limited, such surveys may not be necessary.

Potential Environmental Effects

7.7.18 Minimising direct effects arising from land take, and managing construction and operation in order to avoid or minimise indirect effects will reduce the potential for likely significant impacts on ecological features (see below). However, the approach required for site management, mitigation, compensation, enhancement and/or monitoring will be determined in the light of the results of the surveys set out above, and having regard to planning policy requirements and/or the legislative protection afforded to the ecological feature.

7.7.19 Having regard to the characteristics of the REP site, the surrounding area and the proposed development, the construction and operation of REP has the potential to result in the following effects:

- Habitat loss, disturbance (including through shading) or fragmentation during site clearance and/or construction;
- Noise and/or visual disturbance during site clearance, construction or operation;
- Dust during site clearance and/or construction;
- Surface water drainage during construction or operation;
- Lighting during construction or operation; and
- Emissions / deposition during operation.

7.7.20 This chapter identifies the likely ecological features and effects of REP which, at this stage, are considered to have the potential to result in significant ecological impacts and thus require detailed assessment through the EIA process. It also confirms the proposed survey approach and assessment methodologies.

7.7.21 The 'Study Area' over which likely significant effects would be expected on the ecological features considered in this chapter is variable, dependent on the sensitivity of the ecological feature and the effects being considered. Good practice guidance, published peer reviewed papers and ecological experience and understanding will all contribute in determining the Study Area for each ecological feature and will be agreed with statutory consultees, as required.

Method

7.7.22 The Terrestrial Biodiversity chapter of the ES will be guided by best practice guidance for ecological impact assessment (EcIA) set out by the Chartered Institute of Ecology and Ecological Management (CIEEM, 2016).

7.7.23 As detailed above, the baseline conditions within the REP site will be determined through the completion of survey work during 2017 / 2018. All survey work, an indication as to the scope of which is given in the preceding section, will be undertaken with regard to relevant best practice guidelines. Ecological data obtained to inform the adjacent RRRF planning submission, and gathered post-construction as part of planning condition requirements, will also be reviewed and used to inform baseline conditions, along with any other data secured from GiGL, where relevant.

7.7.24 For the section of the Terrestrial Biodiversity chapter relating to impacts from future climate change scenarios, weather predictions will be obtained through the UK Climate Change Projections (CP09), a service provided by the Environment Agency and the UK Met office. Consideration will then be given to if / how weather variations may impact species and habitats associated with the REP site and its immediate surrounds.

7.7.25 Establishing a comprehensive ecological baseline, and application of the EcIA guidelines, will allow a value to be attributed to each ecological receptor in accordance with CIEEM's geographic framework which, for the purpose of the REP site, will be: local, district (Borough), regional (London and the South-East), national (England) and international (European or Worldwide). In order to determine the likelihood of a significant ecological effect, it will be necessary to identify whether an ecological feature is sufficiently valuable for a significant effect upon it to be material in decision-making. Reference will be made to any technical assessments within supporting reports which will be appended to the ES.

7.7.26 Only those ecological features that it is considered could experience significant effects (i.e. impacts that could adversely affect the integrity of the habitat or the favourable conservation status of a species' local population), and which are identified as being of sufficient value to be material to decision-making (i.e. of 'district' (borough) level importance or above), will be classified as being 'Key Ecological Features'. It is these ecological features that will be

considered in the assessment, ensuring the assessment focuses only on those impacts which have the likelihood for being environmentally significant.

7.7.27 However, those ecological features which are not valued as being important within the context of the EIA will still warrant consideration during the design and mitigation of the proposed development on the basis of their legal protection and/ or their implications for environmental (and related) policies and plans. Therefore, consideration will separately be given to these (as well as Ecological Features of less than 'district' level importance); by cross-reference to a separate Ecological Appraisal Report to demonstrate that the development does not contravene legislation.

7.7.28 A logical and transparent assessment of impacts and associated effects on each 'Important' ecological feature during the construction and operational phases of REP will be presented in the Terrestrial Biodiversity chapter of the ES. Potential effects on 'Important' ecological features will be identified along with the mitigation and/or management or monitoring measures required to prevent, reduce or off-set any significant adverse impacts. Significant beneficial ecological impacts will also be described. The Terrestrial Biodiversity chapter will set out the significance of any residual ecological impacts and clarify whether these are adverse or beneficial. In each case the significance of effect will be expressed in accordance with CIEEM's geographic frame of reference. The wider ES will use generic significance criteria, based on their importance to the decision-making process, to describe the significance of environmental effects. **Table 7.7.2** provides a means of relating these two approaches and will be included within the Terrestrial Biodiversity chapter of the ES to allow the ecological impact assessment to be integrated into the wider EIA without compromising the CIEEM best practice approach.

Table 7.7.2 Ecological Significance Criteria

EIA Significance level		Generic Environmental Criteria	CIEEM geographical criteria
Significant	Substantial	These effects are assigned this level of significance as they represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites and features of national or regional importance. A change at a district scale site or feature may also enter this category.	Ecological impacts assessed as being significant at regional or higher geographical scales and that have triggered a response in development control terms are considered to represent impacts that overall within this assessment are of severe significance.
	Major	These effects are likely to be important considerations at a local or district scale and may become key factors in the decision-making process.	Ecological impacts assessed as being significant at the borough (district) or county scales and that have triggered a response in development control terms are considered to represent impacts that overall within this assessment are of major significance.
	Moderate	These effects, while important at a local scale, are not likely to be key decision-making issues.	Ecological impacts assessed as being significant at the local scale and that have triggered a response in development control terms will be considered to represent impacts that overall within this assessment are of moderate significance.

EIA Significance level		Generic Environmental Criteria	CIEEM geographical criteria
Not significant	Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.	Ecological impacts that have been assessed as being significant within the immediate zone of influence and are unlikely to trigger a response in development control terms are considered to represent impacts that overall within this assessment are of minor significance.
	Negligible	Either no effect or effect which is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. Such effects should not be considered by the decision-maker.	Ecological impacts that have been assessed as not being significant at any geographic level.

7.7.29 The residual impacts of REP, taking into account mitigation, will also be assessed cumulatively in the context of other (relevant) proposed developments within the vicinity of the proposed development (to be agreed with consultees).

7.8 Marine Biodiversity

Introduction

7.8.1 This section identifies the proposed scope of the EIA to assess likely significant effects from the proposed development on marine ecology receptors. Specifically, this includes consideration of likely significant effects on intertidal and subtidal benthic habitats and species, fish and marine mammals.

Baseline Conditions

Designated Areas

7.8.2 The closest internationally designated sites that support marine features (the Thames Estuary and Marshes SPA and Thames Estuary and Marshes Ramsar site) are located approximately 20 km from the proposed development and as such are considered to fall outside of the assessment study area.

7.8.3 The closest nationally designated site that supports marine features (the Inner Thames Marshes SSSI) is located approximately 1.4 km north-east of the closest part of the application site and will therefore be considered as part of the assessment.

7.8.4 The Scheme directly overlaps with the Thames Estuary recommended Marine Conservation Zone (rMCZ) which stretches from Richmond to the wider mouth at Southend and Grain. Four subtidal and intertidal habitats and three species features are considered for designation in this site. The habitat features are: intertidal mixed sediments, subtidal coarse sediment, subtidal sand and subtidal mud. The species features proposed are: tentacled lagoon worm *Alkmaria romijni* and smelt *Osmerus eperlanus* (Balanced Seas, 2011). This rMCZ was included in the second tranche of sites proposed for designation in 2015/16. However, its designation is currently on hold as Defra has indicated a need to better understand the implications of designation of the site on potential developments within the estuary. A formal MCZ assessment is consequently not required at this point of time (MMO, 2013).

Benthic habitats and species

7.8.5 The intertidal habitats in the inner and middle sections of the Thames Estuary consists mostly of fine, silty sediment with a few sandy areas. Subtidal habitat in this area consists of mud and scoured gravel sediment. Salinity is generally considered the most significant factor influencing species distributions in estuaries (Attrill, 1998). Changes in the invertebrate composition along the estuary reflect the tolerance that individual species have to variations in salinity (ABPmer, 2013).

7.8.6 The estuarine environment within the area of the proposed development has been previously characterised by a relatively limited fauna comprising freshwater species that can tolerate the increased salinity and estuarine species capable of withstanding wide variations in saline conditions. Invertebrate species typically found within the intertidal zone of this area include tubificid oligochaetes such as *Limnodrilus hoffmeisteri* (principally a freshwater species) and *Baltidrilus costatus* (an estuarine species). Other species occurring in the intertidal zone include the estuarine mud shrimp *Corophium lacustre* and marine polychaetes such as *Nereis* sp (ABPmer, 2007; Attrill, 1998; Transport for London, 2016).

7.8.7 Species found within the subtidal zone in brackish sections of the Thames Estuary include the scavenging estuarine amphipod *Gammarus zaddachi*, the oligochaete *Tubifex* and non-native mollusc *Potamopyrgus antipodarum* (ABPmer, 2007; Transport for London, 2016).

7.8.8 Environment Agency records indicate that the protected tentacled lagoon worm *Alkmaria romijni* has been recorded in close proximity to the application site. The tentacled lagoon worm is nationally scarce and is therefore a protected species under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is also a feature of the Thames Estuary rMCZ. The Wildlife and Countryside Act protection specifically concerns the habitat of the species, whilst the rMCZ considers the protection of the species at the population level. The tentacled lagoon worm is typically found in areas sheltered from waves and low salinity on both intertidal and subtidal mud.

7.8.9 In addition, suitable habitat for the lagoon sea slug *Tenellia adspersa* has also been identified in relatively close proximity to the proposed works (Transport for London, 2016). The lagoon sea slug is protected under Schedule 5 of the Wildlife and Countryside Act 1981. The species is also classified as a species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006 and listed as a UK Biodiversity Action Plan (BAP) Priority Species.

7.8.10 A number of non-native benthic marine species have been recorded in the Thames including the carpet sea squirt *Didemnum vexillum,* polychaete *Boccardiella ligerica* and Chinese mitten crab *Eriocheir sinensis* (Transport for London, 2016).

Fish

7.8.11 The Thames Estuary supports a diverse fish fauna with over 100 fish species recorded. Fish species with known spawning and nursery locations within the Thames Estuary include herring *Clupea harengus*, lemon sole *Microstomus kitt* and Dover sole *Solea solea*. Other commercially important fish species which also utilise the Thames Estuary for nursery areas include plaice *Pleuronectes platessa*, sprat *Sprattus sprattus* and bass *Dicentrarchus labrax*. The short-snouted seahorse *Hippocampus hippocampus* and long-snouted seahorse *Hippocampus guttulatus* have also both been recorded in the Thames Estuary. Diadromous fish which migrate through the estuary include the European eel *Anguilla anguilla*, European smelt *Osmerus eperlanus,* sea lamprey *Petromyzon maximus*, Atlantic salmon *Salmo salar*, river lamprey *Lampetra fluviatilis* and the twaite shad *Alosa fallax*. The Thames Estuary is also an important area for many shellfish species, with large beds of cockle *Cerastoderma edule*, oyster *Ostrea edulis* and mussel *Mytilus edulis* being present throughout the outer Estuary (Potts and Swaby, 1993; Ellis *et al*., 2012; ZSL, 2017; ZSL, 2016).

7.8.12 Previous Environment Agency Transitional and Coastal (TraC) fish monitoring undertaken nearby to the proposed development has recorded a range of species with sand goby *Pomatoschistus minutus*, flounder *Platichthys flesus*, 3-spined stickleback *Gasterosteus aculeatus*, common goby *Pomatoschistus microps* and sand smelt *Atherina presbyter* all commonly recorded.

Marine Mammals

7.8.13 Grey seal *Halichoerus grypus* and common seal *Phoca vitulina* breed at haul out sites along the Norfolk coast, Kent coast and Thames Estuary and are regularly recorded foraging in the inner Thames Estuary (ZSL, 2015a; ZSL, 2015b, ZSL, 2015c). The harbour porpoise *Phocoena phocoena* is the only cetacean (whale and dolphin) species recorded with any regularity in the Thames Estuary. Bottlenose dolphin *Tursiops truncatus* is also occasionally recorded (ZSL, 2015a). Other species are considered rare vagrant visitors to the Thames Estuary (Sea Watch Foundation, 2006a; Reid *et al*., 2003).

7.8.14 Numerous sightings of both common seal and grey seal have been recorded relatively nearby to the application site as part of opportunistic sightings of marine mammals in the Thames compiled by the Zoological Society London (ZSL) since 2004 (ZSL, 2015a). Infrequent sightings of harbour porpoise have also been recorded in the wider area (ZSL, 2015a).

Potential Environmental Effects

7.8.15 The Marine Biodiversity chapter will outline the source-pathway-receptor relationship relating to infrastructure associated with the marine element of the proposed works. The key impact pathways that will be considered include:

- Temporary loss of benthic habitat (and associated species) associated with the footprint of any marine infrastructure and dredging;
- Temporary impacts to benthic habitat and species through changes to the physical environment associated with the presence of marine infrastructure and any potential dredging works;
- Temporary changes in water quality on benthos and fish associated with the installation, use and removal of any marine infrastructure and any potential dredging works;
- Underwater noise impacts on fish and marine mammals associated with the construction (and removal) of marine infrastructure and any potential dredging works; and
- Non-native species transfer and introduction.

7.8.16 **Table 7.8.1** describes potential effects due to the proposed development which are not likely to be significant, based on the current understanding of the proposed scheme design, and therefore have been scoped out of further assessment.

Table 7.8.1 Effects to be scoped out of further assessment

Receptor	Pathway Scoped Out of Assessment	Justification
Benthic species and shellfish.	Noise disturbance.	Studies have indicated that crustacean species are able to respond to a wide frequency bandwidth, although their sensitivity to underwater sound and vibration is very much lower than fish (Parvin *et al*. 2008). It is therefore considered unlikely that noise levels

Receptor	Pathway Scoped Out of Assessment	Justification
		would adversely affect the benthic community or shellfish found in the vicinity of the proposed development.
Fish and marine mammals.	Temporary habitat loss and change as a result of marine infrastructure.	There is the potential for impacts to fish and marine mammals as a result of temporary habitat loss due to the footprint of marine infrastructure and also indirectly arising from changes to hydrodynamic and sedimentary transport regimes associated with the temporary marine infrastructure. However, the footprint of the proposed works and extent of indirect habitat change only covers a highly localised area that constitutes a very small fraction of the known ranges of local fish and marine mammal populations.
Fish and marine mammals.	Noise disturbance as a result of vessel movement during the marine element of the project.	There is the potential for noise disturbance to fish species as a result of vessel movements. However, vessel noise is unlikely to be discernible above ambient levels in the Thames Estuary.
Fish	Light disturbance	There is the potential for artificial light from lighting on marine infrastructure to modify fish behaviour and potentially disrupt migratory movements. However, the area of river that will be lit as a result of the new temporary infrastructure will only constitute a small fraction of the total width of the river and therefore no disruption or blocking of migratory routes are anticipated.
Marine mammals	Water Quality	Temporary and localised changes in water quality are considered unlikely to produce lethal and sub-lethal effects in these highly mobile species. The potential for accidental spillages will also be negligible during all phases through following established industry guidance and protocols.
Marine mammals	Collision risk/visual disturbance (including light)	Marine mammals are regularly exposed to vessel movements, using the Thames Estuary and routinely avoid collision. As such they are expected to be habituated to high levels of disturbance and light stimuli. Furthermore, vessel movements in the vicinity of the proposed development (associated with the marine works) are

Receptor	Pathway Scoped Out of Assessment	Justification
		mainly expected to be stationary or travelling at low speeds, making the risk of collision very low.

Method

Relevant technical guidance/standards, consultations and information sources

7.8.17 The assessment will be completed in accordance with Charted Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2016). Specific assessments will also take in to consideration the latest statutory guidance (e.g. The Protection of Marine European Protected Species from Injury and Disturbance).

7.8.18 The following key data sources will be reviewed as part of establishing baseline conditions:

- Sightings and monitoring data on marine mammals compiled by the London Zoological Society (ZSL);
- Environment Agency benthic, fish monitoring and specific tentacled lagoon worm records data;
- Data on marine species compiled on the National Biodiversity Network (www.nbn.org.uk); and
- Marine ecology information collated as part of previous impact assessments for developments in the nearby area (which are known to include habitats that have been identified as suitable for the lagoon seaslug).

7.8.19 A benthic grab sampling survey of the subtidal habitats within and nearby to the proposed development may be undertaken if deemed necessary following discussion with the Marine Management Organisation (MMO), Natural England and the Environment Agency. In addition, a Phase 1 Intertidal Habitat Survey will be undertaken (including the collection of intertidal core samples). The purpose of these surveys is to better understand the infaunal invertebrate assemblage occurring in the area and confirm the presence of any nationally rare or protected species (such as the tentacled lagoon worm). No fish or marine mammal surveys are proposed.

7.8.20 Consultation will be undertaken with the MMO, Natural England and the Environment Agency to confirm the scope of all survey requirements.

7.8.21 The Marine Biodiversity chapter will also be informed by the results of the Marine Geomorphology Assessment and Water Quality Assessment.

Approach to assessment methodology

7.8.22 The marine related works are temporary and limited to the construction phase of the proposed development. In this context, all marine infrastructure will be removed at the end of the construction phase and the seabed restored at this point in time. Accordingly, all impacts associated with the marine works (including the decommissioning of any structures) are considered to occur in the construction phase of the project as a whole.

7.8.23 An assessment of the potential impacts associated with the proposed development will be undertaken, including all relevant impact pathways that could arise from any phase of the proposed development. The CIEEM (2016) guidelines state that ecological impact assessment is the 'process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems'. It requires an assessment of likely significant effects on important ecological features, and as such, does not require consideration of effects on every species or habitat that may be present within the site.

7.8.24 In order to determine whether there are likely to be significant effects, it is first necessary to identify whether an ecological feature is 'important', and therefore whether an effect upon it could be significant, and thus, material in decision-making. To achieve this, where possible, marine species and their populations will be valued on the basis of a combination of their rarity, status and distribution, using contextual information where it exists. Similarly, the importance of marine habitats will be evaluated against existing selection criteria, wherever possible, such as those developed to aid the designation of SSSIs or non-statutory designated sites.

7.8.25 Determination of the significance of the predicted ecological effects will be based on professional judgement having regard to the positive (beneficial) or negative (adverse) nature, extent, magnitude, duration, timing, frequency and reversibility of the impacts assessed. An effect will be determined as being significant when it 'either supports or undermines biodiversity conservation objectives for important ecological features' (CIEEM, 2016). In determining significance, consideration is given to aspects of the structure and function of designated sites and habitats, the conservation status of species, and the likely resilience of ecological features to change.

7.8.26 An effect on an important ecological feature may be considered to be significant at a variety of geographic scales from international to less than local. The effect may be significant at the same geographic scale at which the feature is determined to be important, or at a lesser geographical scale, depending on the characterisation of the impact. However, CIEEM (2016) also advocates that significance is expressed using the generic significance criteria typically used for other topics within an environmental statement. This approach has been taken in order to allow integration with the assessment of all environmental impacts. Therefore, the key significance levels for either beneficial or adverse impacts on relevant receptors is summarised in **Table 7.8.2**.

Table 7.8.2 Significance criteria

Significance level	Generic criteria	CIEEM geographical criteria
Severe	These effects are assigned this level of significance as they represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites and features of national or regional importance. A change at a district scale site or feature may also enter this category.	Ecological impacts assessed as being significant at national or higher geographical scales and that have triggered a response in development control terms are considered to represent impacts that overall fit within this assessment, are of severe significance.
Major	These effects are likely to be important considerations at a local or district scale and may become key factors in the decision-making process.	Ecological impacts assessed as being significant at the regional scales and that has triggered a response in development control terms are considered to represent impacts that overall within this assessment are of major significance.

Significance level	Generic criteria	CIEEM geographical criteria
Moderate	These effects, while important at a local scale, are not likely to be key decision-making issues.	Ecological impacts assessed as being significant at the county scale, and that have triggered a response in development control terms, will be considered to represent impacts that overall within this assessment are of moderate significance.
Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.	Ecological impacts assessed as being significant at the local scale, and that have triggered a response in development control terms, will be considered to represent impacts that overall within this assessment are of minor significance.
Negligible	Either no effect or effect which is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. Such effects should not be considered by the decision-maker.	Ecological impacts that have been assessed as not being significant at any geographic level

7.8.27 With specific respect to the noise assessment, a logarithmic spreading model will be used to predict the propagation of sound pressure with range from any marine piling. This model is represented by a logarithmic equation and will incorporate factors for noise attenuation and absorption losses based on empirical data from coastal environments. This model has been advocated by the UK regulators in a number of EIAs for recent coastal developments. The application of this model is therefore considered appropriate for this study.

7.8.28 A range of available published criteria will be used to assess the potential physiological and behavioural effects of underwater noise on marine mammals, fish and shellfish (namely Southall et al. 2007; Hawkins et al. 2014; Popper et al. 2014; National Oceanic and Atmospheric Administration (NOAA), 2016;). Unpublished criteria, namely dBht (species) proposed by Nedwell et al. (2007), will also be used to provide context as this metric has been used in numerous past EIAs.

Identification of additional mitigation, enhancement and monitoring requirements

7.8.29 Measures may be required to mitigate potentially adverse impacts that have been identified during the assessment phase. Based on an initial broad assessment, underwater noise disturbance impacts to migratory fish during construction have the potential to be significant and could require appropriate mitigation. This might include following soft start procedures for marine piling and for employing seasonal restrictions on the marine works.

Potential risks and limitations of assessment

7.8.30 Data availability could provide a limitation to the assessment and as such benthic surveys have been proposed and will be discussed with the MMO, Natural England and the Environment Agency. This will be used to inform the risk of protected species being located within the study area.

7.9 Marine Geomorphology

Introduction

7.9.1 This section identifies the proposed scope of the EIA to assess likely significant effects from the proposed development on marine geomorphology receptors. Specifically, this includes consideration of potential effects on geomorphology, hydrodynamics, waves, sediment dynamics and water/ sediment quality.

Baseline Conditions

7.9.2 Any proposed temporary marine works would be located approximately half way along the tidal Thames Estuary (Halfway Reach) on the south bank between Belvedere and Erith Marshes, *circa* 50 km from the open sea beyond Southend. The morphology of the river in this location is a single deep meandering channel with relatively steep subtidal banks leading to 'fringes' of muddy intertidal. The river is lined with a significant number of wharves and jetties which locally 'train' the main tidal river flows between the jetty faces and produce slower flows on the shallower areas behind.

Geomorphology

7.9.3 The geology of the Thames in the vicinity of the proposed works predominantly comprises post glacial Holocene deposits. These comprise interbedded layers of mud, peat, sand and gravels that reflect the changes from river to estuary dominated flows over time, which can be consolidated in character. The bed of the estuary currently comprises predominantly alluvium and intertidal muddy deposits, which are relatively consolidated with the exception of a thin transient layer.

7.9.4 The United Kingdom Hydrographic Office (UKHO) Admiralty Chart No. 2151 ("River Thames – Tilbury to Margaret Ness") shows maximum depths in the main channel opposite the development of between 8 to 9 metres chart datum (mCD). The width of the estuary at this location is approximately 690 m (at MHWS) with intertidal areas of *circa* 100 m width on either side.

Hydrodynamics

7.9.5 The hydrodynamic conditions at the application site are primarily influenced by tidal propagation through the Thames Estuary, modified by freshwater flow from the river. Tide level information from UKHO (2016) is provided in **Table 7.9.1** for the closest secondary port locations either side of the application site, i.e. Erith and North Woolwich. The conversion from mCD to metres relative to Ordnance Datum Newlyn (mODN) is -3.28 m for Erith and -3.35 m for Woolwich.

Table 7.9.1: Characteristic tidal levels (metres Chart Datum)

Location	Highest Astronomical Tide (HAT)	Mean High Water Springs (MHWS)	Mean High Water Neaps (MHWN)	Mean Low Water Springs (MLWS)	Mean Low Water Neaps (MLWS)
Erith (Secondary Port)		6.5	5.3	1.6	0.5
North Woolwich (Standard Port)	7.8	7.2	5.9	1.6	0.6

7.9.6 In general, the Thames Estuary can be classed as macrotidal (>4 m within Halfway Reach) and Admiralty Tidal Stream data for Halfway Reach shows flows of about 1.5 m/s and 1.25 m/s on the flood and ebb respectively on mean spring tides. The flows only reduce to below

0.75 m/s for an hour either side of both high and low water. Neap flows are approximately 70% of the spring tide rates.

Waves

7.9.7 Given the specific location of the part of the application site in the Thames Estuary, wave activity at the site is small, with the worst conditions generated by westerly local winds over a fetch of *circa* 2.5 km. Further wave activity will also result from passing vessels. The bends and narrow cross section of the estuary significantly limit the potential for swell wave activity.

Sediment dynamics

7.9.8 The high flow speeds within the estuary mean that the sediment transport rates in the vicinity of the application site are high and there is limited accretion of fine mud sediments in the main channel. Accretion is, however, possible over the intertidal, predominantly over high water, except at the edge of the main channel, although for the most part an equilibrium has been established. This is common throughout the Thames Estuary where the intertidal over time has generally accreted behind fronting jetty structures.

7.9.9 Transects measuring the suspended sediment concentrations in 2004 for the Thames Estuary 2100 project (TE2100) showed spring tide width averaged concentrations of over 500 mg/l with peaks approaching 1,000 mg/l in the approximate location of the proposed scheme; the highest concentrations within the estuary.

Water and sediment quality

7.9.10 Many standards for water quality are regulated at European Union (EU) level through a range of environmental directives. The most relevant for the proposed development comprise the Water Framework Directive (WFD) (2000/60/EC), the Priority Substances Directive (2008/105/EC and 2013/39/EU), the revised Bathing Water Directive (2006/113/EC) and the Nitrates Directive (91/676/EEC).

7.9.11 The WFD (2000/60/EC) came into force in 2000 and establishes a framework for the management and protection of Europe's water resources. It is implemented in England and Wales through the Water Environment (WFD) (England and Wales) Regulations 2003 (the Water Framework Regulations). The overall objective of the WFD is to achieve good status (GS) in all inland, transitional, coastal and ground waters by 2015, unless alternative objectives are set and there are appropriate reasons for time limited derogation.

7.9.12 River Basin Management Plans (RBMPs) are a requirement of the WFD, setting out measures for each river basin district to maintain and improve quality in surface and groundwater water bodies where necessary. The Environment Agency published updated RBMPs for England as part of the second cycle (2015 to 2021). The proposed works at Belvedere are located within the Thames Middle transitional water body (ID: GB530603911402) in the Thames river basin district which is reported in the Thames RBMP (Environment Agency, 2016 [1]).

7.9.13 The Southend shellfish water, designated under the Shellfish Waters Directive (2006/113/EC), is the closest shellfish water protected area to the proposed development at approximately 30 km to the east; however, it should be noted that the Shellfish Waters Directive was repealed in 2013 and subsumed within the WFD.

7.9.14 The revised Bathing Water Directive sets physical, chemical and microbiological standards for bathing waters in the EU. It was introduced to update the (old) Bathing Water Directive (76/160/EEC) to ensure compatibility with the WFD. There are no designated bathing waters in the vicinity of the application site; the nearest bathing water (The Serpentine in Hyde Park) is located greater than 20 km to the west and is discrete from the Thames Estuary.

[1] https://www.gov.uk/government/publications/thames-river-basin-district-river-basin-management-plan

7.9.15 The Nitrates Directive (91/676/EEC) aims to reduce water pollution from agricultural sources and to prevent such pollution occurring in the future (nitrogen is one of the nutrients that can affect plant growth). Under the Nitrates Directive, surface waters are identified if too much nitrogen has caused a change in plant growth which affects existing plants and animals and the use of the water body. The Thames Middle transitional water body is designated under the Nitrates Directive. There are two surface water Nitrate Vulnerable Zones (NVZs), designated as being at risk from agricultural nitrate pollution, located directly opposite the proposed works (i.e. on the North bank of the estuary).

7.9.16 Given the historic and current industrial use of the Thames Estuary it is possible that marine sediments will be contaminated in the vicinity of the application site. EA monitoring in the locality of the REP site, has sampled sediment contaminant concentrations above the Cefas Guidelines Action Level 1 and Level 2.

Potential Environmental Effects

7.9.17 The marine related works are temporary and limited to the construction phase of the proposed development. In this context, all marine infrastructure will be removed at the end of the construction phase and the seabed restored at this point in time. Accordingly, all impacts associated with the marine works (including the decommissioning of any structures) are considered to occur in the construction phase of the project as a whole.

7.9.18 The Marine Geomorphology chapter will outline the source-pathway-receptor relationship relating to the construction (including any dredging requirement), presence, use of and removal of the temporary marine infrastructure. The key impact pathways that will be considered include:

- Direct morphological change from the presence of the marine infrastructure and any associated dredge;
- Changes to the hydrodynamic regime;
- Changes to sediment transport processes (including erosion and deposition); and
- Changes to water and sediment quality (including suspended sediment concentrations and contaminants).

7.9.19 Considerations regarding any changes to habitat extent through construction and removal of the marine infrastructure, as well as subsequent scouring (indirect), will also be made to inform the marine ecology assessment. In addition, consideration will also be given to the requirements of the WFD and any potential to cause a deterioration in status of the Thames Estuary transitional water body (and adjacent water bodies), or prevent the water body from achieving its WFD objectives in the future.

7.9.20 Those pathways which can be scoped out of requiring further assessment, based on current scheme assumptions, are summarised in **Table 7.9.2**.

Table 7.9.2. Potential effects scoped out of further assessment

Impact pathway	Rationale
Changes to the wave climate	The complex morphological shape of the Thames Estuary is likely to lead to dissipation of swell waves prior to entering the middle estuary containing the proposed development. Consequently, any wave activity at the site would be a result of local wind-generation and will be small in magnitude. Changes to the localised wave climate within the section of estuary containing the proposed development will be negligible as a result of the marine works.

Impact pathway	Rationale
Changes in quality of bathing waters	The nearest bathing water (The Serpentine in Hyde Park) is located greater than 20 km from the application site. There is no potential for the proposed scheme to cause a significant impact on bathing waters.
Changes in quality of shellfish water protected areas	The nearest shellfish water protected area (Southend shellfish water) is located greater than 30 km from the application site. There is no potential for the proposed scheme to cause a significant impact on shellfish water protected areas.

Method

Relevant technical guidance/standards, consultations and information sources

7.9.21 Assessment of potential effects on the local hydrodynamic and morphological regime due to the proposed development will be based on a conceptual understanding of the study area. This will be based on available data sets from any existing field surveys and any relevant previous available modelling results but without the use of new bespoke numerical modelling. Information requests will be made to the Port of London Authority (PLA) to obtain latest bathymetry data.

7.9.22 The Environment Agency's "Clearing the Waters for All" process will be used for the WFD assessment. The guidance outlines how to assess the impact(s) of activities in transitional and coastal waters in relation to WFD objectives, setting out the following three discrete stages:

- Screening: excludes any activities that do not need to go through the scoping or impact assessment stages;
- Scoping: identifies the receptors that are potentially at risk from an activity and need impact assessment; and
- Impact Assessment: considers the potential impacts of an activity, identifies ways to avoid or minimise impacts, and indicates if an activity may cause deterioration or jeopardise the water body achieving good status.

7.9.23 A sediment contamination survey will be undertaken to inform the water and sediment quality assessment. No additional field data will be collected to support the marine geomorphology assessment.

Approach to assessment methodology

7.9.24 An assessment of the likely significant effects associated with the proposed development will be undertaken. This will include all relevant impact pathways that could arise from any phase of the proposed development. It is proposed that the EIA methodology will follow the standard source-pathway-receptor approach to impact quantification.

7.9.25 The importance of a receptor, as classified in **Table 7.9.3**, is based on its value and rarity to either the ecosystem or to society or the economy, as well as the level of protection it is afforded.

Table 7.9.3. Receptor importance

Receptor Importance	Definition
High	Receptor internationally designated and/or of international ecological importance. Likely to be rare with minimal potential for

Receptor Importance	Definition
	substitution or unable to tolerate change. May also be of high or very high socio-economic importance.
Moderate	Receptor nationally designated and/or of national ecological importance. Likely to be relatively rare. May also be of high socio-economic importance.
Low	Receptor not designated but of local to regional importance; or not designated/of local importance.
Negligible	Receptor only of local importance with a high tolerance to change.

7.9.26 The three main steps that will be used to determine the significance of environmental effects of the proposed development on marine geomorphological receptors are summarised below:

- Step 1 – Identify the potential environmental changes resulting from the proposed development and the receptors (including their respective value) that are likely to be affected, together referred to as the impact pathway.
- Step 2 – Understand the nature of the likely environmental changes in terms of their exposure characteristics, the natural conditions of the marine geomorphological system and the sensitivity of the specific receptors, and the impact of the changes upon them.
- Step 3 – Evaluate the value and vulnerability of marine geomorphology receptors as a basis for assessing the significance of an impact. The key significance levels for either beneficial or adverse impacts will be determined. This determination of significance will also take in to account the influence of all mitigation measures.

Identification of additional mitigation, enhancement and monitoring requirements

7.9.27 Measures may be required to mitigate potentially adverse effects that are identified during the assessment phase. The significance of changes to the hydrodynamic regime and sediment transport processes are anticipated to vary between negligible and moderate (dependent on the final design of the marine works), therefore additional mitigation and monitoring requirements may be identified if necessary/practicable.

Potential risks and limitations of assessment

7.9.28 Data availability could provide a limitation to the assessment (e.g. provision of local flow rates). Should this become apparent, a judgement on the significance of these limitations on the assessment will be made in the context of the final scheme design and the construction/decommissioning method for the installation/removal of the marine infrastructure.

7.10 Hydrology, Flood Risk and Water Resources

Introduction

7.10.1 The ES chapter will assess the likely significant effects of REP upon water resources, hydrology, flood risk and surface water drainage during both the construction and operational phases. The chapter will set out the existing/baseline conditions, summarise the potential direct and indirect impacts of REP, the mitigation measures required to prevent, reduce or offset the impacts and the residual impacts. The ES chapter will be supported by a Flood Risk Assessment (FRA). The FRA will consider whether REP is likely to be affected by current or future flooding from any source and will categorise the site in accordance with the Flood Zones set out in the National Planning Policy Framework and associated Planning Practice Guidance. The FRA will also consider whether the development will increase flood risk elsewhere and the nature of mitigation measures required to deal with development impacts.

Baseline Conditions

7.10.2 The principal watercourse in the area is the River Thames (immediately to the north of the REP site) which is tidally influenced along the reach adjacent to the REP site. A network of watercourses, classified as Main River and therefore under the jurisdiction of the Environment Agency, is located to the south of the REP site, outfalling to the River Thames via a branch flowing immediately to the west of the REP site.

7.10.3 The Environment Agency (EA) publishes floodplain maps on the internet (https://flood-map-for-planning.service.gov.uk/). These maps show the possible extent of tidal flooding associated with a 1 in 200 year event (0.5% probability of occurrence), ignoring the presence of flood defences. Also shown is the possible extent of flooding arising from a 1 in 1,000 year event (0.1% probability).

7.10.4 The flood map indicates that the REP site is located within Flood Zone 3 (High Probability – land having a 1 in 200 or greater annual probability of sea flooding). However, the flood map also indicates that the REP site falls within an area that benefits from flood defences. In this instance, the standard of protection afforded by the defences is 1 in 1,000 years.

7.10.5 The REP site is currently used predominantly as an ancillary area for RRRF. Uses include ash container storage, compounds for operational plant maintenance activities, a non-designated Wasteland Habitat Area, circulation roads and car-parking. The REP site therefore comprises both permeable and impermeable surfaces and surface water run-off generally infiltrates into the ground or is routed to the watercourses located to the south and west.

7.10.6 The EA 'Flood Risk from Surface Water Map' (https://flood-warning-information.service.gov.uk/long-term-flood-risk) shows areas that may be susceptible to surface water flooding following an extreme rainfall event. The map highlights a number of corridors within and adjacent to the REP site at high, medium and low risk of surface water flooding. These areas generally coincide with watercourses/ditches/drains and topographical 'low' points across the terrain (i.e. areas where surface water would naturally accumulate following rainfall).

Potential Environmental Effects

7.10.7 Construction activities will include the clearance of vegetation, topsoil stripping, establishment of compound areas, excavation and site levelling/re-profiling to create development platforms, preparation of site roads and construction of foundations. Compaction of the ground caused by construction plant and an increase in the extent of impermeable surfaces associated with access roads and compound areas have the potential to impact upon the surface water drainage regime and increase surface water run-off from the REP site.

7.10.8 Construction activities also have the potential to give rise to the contamination of surface water resulting from spilled hydrocarbons/petrochemicals from construction plant and the mobilisation of silts and contaminants during earthworks operations.

7.10.9 REP is likely to give rise to an increase in the impermeable area within the REP site, associated with site roads and power generation infrastructure, thereby increasing surface water run-off during the operational phase. This has the potential to increase flood risk to existing development/infrastructure/third party assets and land downstream of the REP site.

7.10.10 During the operational phase, there is the potential for the contamination of surface water resulting from the flushing of silts and hydrocarbons from areas of hardstanding.

7.10.11 The proposals include a new Electrical Connection route (underground) to export power from REP to the National Grid Electricity Transmission System (NETS). Construction activities have the potential to impact upon surface water drainage and water quality. However, during the operational phase, the Electrical Connection will not give rise to impacts upon water resources,

hydrology, flood risk or surface water drainage. It is therefore proposed that consideration of operational impacts associated with the underground Electrical Connection is scoped out of the assessment.

Method

7.10.12 Available existing studies/documents, including evidence base studies undertaken in support of the preparation of the LBB Core Strategy (adopted 2012) and the emerging LBB Local Plan (e.g. Strategic Flood Risk Assessment and Preliminary Flood Risk Assessment), will be reviewed to identify the best available data to be taken forward to inform the EIA/FRA. In addition, the following sources of information will be used to assist with characterising the baseline water environment:

- https://flood-map-for-planning.service.gov.uk/;
- https://flood-warning-information.service.gov.uk/long-term-flood-risk/;
- http://maps.environment-agency.gov.uk/wiyby; and
- http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx.

7.10.13 Consultation with the EA, LBB, LBBD, RBG and DBC will be undertaken to identify and collate data in respect of the baseline water environment, define the scope of investigation/technical work required to inform the FRA and ES chapter, agree assessment methodologies and the design principles to be applied to ensure compliance with the relevant policy, legislation and guidance in respect of flood risk and surface water drainage/management.

7.10.14 A walkover survey will be undertaken to facilitate an understanding of the baseline water environment and the general landform of the REP site and surrounding area and to define the scope/specifications of technical assessments/surveys.

7.10.15 Subject to consultation with the EA, it is anticipated that an assessment of residual flood risk (i.e. associated with breach/overtopping of the flood defences along the northern fringe of the REP site) will be made using data derived through hydraulic modelling analysis and provided by the EA. This information will be used to define peak flood water levels and inform the design/ of REP, including the finished levels of power generation and ancillary infrastructure.

7.10.16 The FRA will assess the existing surface water drainage regime within and in the vicinity of the REP site and identify the current points of outfall for surface water run-off arising from the REP site. A strategy will be devised to control, convey, store and dispose of surface water run-off arising from the REP site during operation. Given the requirement for water for operational processes/activities (i.e. cooling of ash residues), surface water management will be considered as part of an over-arching appraisal of the REP water cycle.

7.10.17 The FRA will include an assessment of the potential impacts of climate change upon flood levels and surface water run-off for the design life of REP, in accordance with EA guidance published in February 2016 (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances).

Water Framework Directive

7.10.18 Overarching National Policy Statement for Energy (EN-1) requires that an ES prepared in support of a DCO application considers whether the proposed development would have an adverse effect upon the achievement of environmental objectives established under the Water Framework Directive (WFD).

7.10.19 Subject to consultation with the Environment Agency (EA), it is currently anticipated that WFD matters will be addressed using the framework set out in the document titled ‘Advice Note

Eighteen: The Water Framework Directive (June 2017)' published by The Planning Inspectorate. This sets out a three stage process to be followed during the pre-application phase, comprising screening, scoping and impact assessment. In the first instance, it is therefore anticipated that a WFD screening exercise will be completed and the EA consulted regarding the findings/conclusions and to agree the way forward.

Significance Criteria

7.10.20 The significance of effects will be assessed by considering the sensitivity of receptors (i.e. their importance and ability to tolerate and recover from change) and the likely magnitude of the impact (i.e. its spatial extent and duration). **Table 7.10.1** outlines the criteria that will be used to determine receptor sensitivity.

Table 7.10.1 Sensitivity/Value of Receptor

Sensitivity/value of a Receptor	Description	Example
High	Attribute with a high quality and rarity, local scale and limited potential for substitution. Attribute with a medium quality and rarity, regional or national scale and limited potential for substitution. Attribute highly sensitive to change.	Examples include: Receiving watercourse classified as High or Good Ecological status/potential under WFD Site protected under EU or UK wildlife legislation (SAC, SPA, SSSI). Species protected under EU or UK wildlife legislation Site located within a Groundwater Source Protection Zone (SPZ) inner or outer protection zone (Zone 1), National Planning Policy Framework (NPPF) Flood Risk Vulnerability Classification “Essential Infrastructure” or “Highly Vulnerable” Environment Agency current groundwater quantitative and chemical qualities defined as Good Human receptors (construction workers and future residents)
Medium	Attribute with a medium quality and rarity, local scale and limited potential for substitution. Attribute reasonably tolerant of change.	Examples include: Floodplain providing a moderate volume of storage Receiving watercourse classified as Good or Moderate Ecological status/potential under WFD NPPF Flood Risk Vulnerability Classification “More Vulnerable”
Low	Attribute with a low quality and rarity, local scale and limited potential for substitution. Attribute tolerant of modest change.	Examples include: Environment Agency current river ecological quality defined as Poor / Bad and chemical quality defined as Fail Floodplain with limited existing development. Receiving watercourse classified as Poor Ecological status/potential under WFD NPPF Flood Risk Vulnerability Classification “Less Vulnerable”
Negligible	Attribute of very limited quality and tolerant of substantial change.	Examples include: Floodplain essentially rural in nature, characterised by agricultural land use NPPF Flood Risk Vulnerability Classification “Water Compatible”

7.10.21 The magnitude of change arising as a result of the proposed development will be assessed using the criteria set out in **Table 7.10.2.**

Table 7.10.2: Magnitude of impact

Magnitude of Impact	Description	Example
Large	Results in a loss of attribute and/or quality and integrity of the attribute. Following development, the baseline situation is fundamentally changed.	Examples include: Change in ecological and/or chemical qualities of the surface water. Loss of flood storage/increased flood risk. Large change in: ▪ water quality of receiving watercourse; ▪ NPPF Flood Risk Vulnerability Classification; ▪ surface water flood risk; ▪ fluvial flood risk; ▪ water supply volume; and ▪ foul drainage volume.
Moderate	Results in impact on integrity of attribute, or loss of part of attribute. Following development, the baseline situation is noticeably changed.	Examples include: Contribution of a significant proportion of the effluent in the receiving river, but insufficient to change its qualities. Moderate change in: ▪ water quality of receiving; watercourse; ▪ NPPF Flood Risk Vulnerability Classification; ▪ surface water flood risk; ▪ fluvial flood risk; ▪ water supply volume; and ▪ foul drainage volume.
Small	Results in some measurable change in attribute's quality or vulnerability. Following development, the baseline situation is largely unchanged with barely discernible differences.	Examples include: Measurable changes in attribute, but of limited extent/duration. Small change in: ▪ water quality of receiving watercourse; ▪ NPPF Flood Risk Vulnerability Classification; ▪ surface water flood risk; ▪ fluvial flood risk; ▪ water supply volume; and ▪ foul drainage volume.
Negligible	The impacts are unlikely to be detectable or outside the norms of natural variation.	

7.10.22 The significance of an effect will be assessed based upon the sensitivity of the receptor and the magnitude of the change using the matrix presented at **Table 7.10.3**.

Table 7.10.3: Determining Significance of Effect

		Sensitivity of Receptor			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Impact	**Large**	Substantial	Major	Moderate	Minor
	Moderate	Major	Moderate	Minor	Negligible
	Small	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible

7.10.23 In the absence of 'industry standard' significance criteria for the consideration of water resources, hydrology and flood risk impacts, a qualitative approach, based upon available knowledge, experience and professional judgement, is employed. The significance criteria that will be used for the purposes of the ES chapter are set out in **Table 7.10.4.**

Table 7.10.4: Hydrology and Flood Risk Significance Criteria

Significance Level	Significance Level Criteria	Typical Examples
Substantial Beneficial	Substantial improvements at catchment scale associated with sites and features of national or regional importance	Fundamental changes to the regional hydrological regime. Fundamental reduction in volume and/or peak discharge of surface water runoff from the Site. Fundamental improvement in surface water quality. Fundamental changes to flow conveyance and floodplain storage.
Major Beneficial	Major improvements at catchment scale	Fundamental changes to the regional hydrological regime. Fundamental reduction in volume and/or peak discharge of surface water runoff from the Site. Fundamental improvement in surface water quality. Fundamental changes to flow conveyance and floodplain storage.
Moderate Beneficial	Improvements at local scale	Moderate changes to the local hydrological regime. Moderate reduction in volume and/or peak discharge of surface water runoff from the Site. Moderate improvement in surface water quality. Moderate changes to flow conveyance and floodplain storage.

Significance Level	Significance Level Criteria	Typical Examples
Minor Beneficial	Limited improvements at local scale	Some noticeable changes to the local hydrological regime. Some noticeable reduction in volume and/or peak discharge of surface water runoff from the Site. Some noticeable improvement in surface water quality. Some noticeable changes to flow conveyance and floodplain storage.
Negligible	No appreciable impact	No noticeable changes to the local hydrological regime. No noticeable change in volume and/or peak discharge of surface water runoff from the Site. No noticeable changes in surface water quality. No noticeable changes to flow conveyance and floodplain storage.
Minor Adverse	Limited detrimental effects at local scale	Some noticeable changes to the local hydrological regime. Some noticeable increase in volume and/or peak discharge of surface water runoff from the Site. Some noticeable deterioration in surface water quality. Some noticeable changes to flow conveyance and floodplain storage.
Moderate Adverse	Detrimental effects at local scale	Moderate changes to the local hydrological regime. Moderate increase in volume and/or peak discharge of surface water runoff from the Site. Moderate deterioration in surface water quality. Moderate changes to flow conveyance and floodplain storage
Major Adverse	Important detrimental effects at catchment scale which may become key factors in the decision-making process	Fundamental changes to the regional hydrological regime. Pollution of potable sources of water abstraction. Fundamental increase in volume and/or peak discharge of surface water runoff from the Site. Fundamental deterioration in surface water quality. Fundamental changes to flow conveyance and floodplain storage.
Substantial Adverse	Substantial detrimental effects at catchment scale	Fundamental changes to the regional hydrological regime.

Significance Level	Significance Level Criteria	Typical Examples
	associated with sites and features of national or regional importance	Pollution of potable sources of water abstraction. Fundamental increase in volume and/or peak discharge of surface water runoff from the Site. Fundamental deterioration in surface water quality. Fundamental changes to flow conveyance and floodplain storage.

7.11 Ground Conditions

Introduction

7.11.1 The ES chapter on ground conditions will establish the baseline conditions at the REP site with reference to geology and ground conditions, in terms of the potential for soil and/or groundwater contamination to exist at the REP site, and also the potential for the REP site to be affected by land instability. The baseline conditions will then be used to assess the likely effects of the proposed development on identified receptors such as human health, the environment and the proposed structures relating to ground conditions, and also the potential for the proposed development to directly contribute to, or be affected by, land instability and geological hazards.

Baseline Conditions

The REP site

7.11.2 A review of historical Ordnance Survey (OS) map records indicates that the majority of the REP site remained undeveloped until the mid 20th Century. From the mid 20th Century there was little significant development on the REP site west of RRRL, although the eastern part is indicated to have been developed as part of a 'Mill' in the mid 20th Century.

7.11.3 The current/recent land use at the REP site includes storage areas for empty containers (for the existing RRRF), a portacabin hire facility, a vegetated habitat area and a plant/equipment/transport maintenance area.

The Surrounding Area

7.11.4 In the areas surrounding the REP site, including areas within the Indicative Application Boundary, the earliest historical OS maps reviewed (1869/1870) indicate very little existing development. The majority of the land is indicated to be part of 'Erith Marshes'.

7.11.5 Although, the land immediately adjacent to the east of the REP site was subject to development in the late 19th Century for the following land uses:

- a 'manure works' (1865);
- 'borate refining' (1896); and
- the 'Belvedere Fish Guano Works' (1897).

7.11.6 From the early to mid 20th century there is little evidence of significant development in the wider area surrounding the REP site. However, from the mid 20th century onwards (specifically between the 1940's and 1960's), there was significant industrial development. A works is shown in one of the proposed temporary construction laydown areas, and a slag/refuse heap

is shown on an area of land to the south of the REP site. Whilst the later maps indicate some redevelopment of parts of the wider area, the general land use remains industrial.

7.11.7 In the areas surrounding the REP site there are varied current land uses, predominantly, areas of open land and existing road networks. There are two areas where the Indicative Application Boundary crosses or extends into the River Thames.

Baseline Conditions

7.11.8 The historical and current land uses at the REP site and in the areas surrounding, such as the manure works, the Guano works, a Borax works, and sewage works, are potentially contaminative and may have contaminated the surrounding soil and groundwater.

7.11.9 The REP may potentially impact the groundwater quality during construction through mobilisation of any potential contamination. In addition, the existence of any soil contamination at the REP site will need to be established and assessed to enable any mitigation or remediation to be determined, for the proposed end use and the protection of human health and other sensitive receptors. Excavations required as part of the proposed development could disturb potentially contaminated material and expose construction workers without appropriate mitigation and/or remediation. It is also known that the adjacent existing RRRF site was remediated prior to development, and a review of available remediation and validation reports for the adjacent site will be included, as described in the method section below.

7.11.10 A review of available information indicates that the REP site is underlain by superficial deposits comprising Alluvium and River Terrace Deposits, and it is anticipated that there will be Made Ground deposits overlying these superficial deposits, associated with the limited historical development on the REP site and the significant development/redevelopment of the adjoining site and in the surrounding areas. The superficial deposits are indicated to be underlain predominantly by either London Clay, the Lambeth Group or the Thanet Formation.

7.11.11 The majority of the REP site is not located within a groundwater SPZ, however part of Electrical Connection Option 2 crosses through Total catchment, Outer and Inner zones of a groundwater source protection zone located in the Crayford/Dartford area. The superficial deposits at the REP site are classified as Secondary A and Secondary (undifferentiated) aquifers. The solid geology underlying the REP site is a mixture of Unproductive Strata, Secondary A and Principal aquifers. In the area of the REP site the underlying London Clay is considered to be Unproductive Strata and provides separation between the aquifers in the superficial deposits with the deeper aquifers in the strata beneath the London Clay.

Potential Environmental Effects

7.11.12 Potential environmental effect's comprise:

- Mobilisation of potential contamination during construction and excavation, affecting controlled waters;
- Creation of pathways during foundation works, affecting controlled waters;
- Exposure of construction workers to potential contamination;
- Introduce higher sensitivity receptors (end users);
- Chemical attack and decay of buried concrete structures;
- Permeation of water supply pipes by potential contaminants and damage to structures by explosion due to ground gases; and

- Introduction of new potential contaminants to the environment.

7.11.13 It is anticipated that due to the historical and current industrial uses in the areas surrounding the REP site, that there will be a baseline level of contamination both in the groundwater and near surface soils at the REP site and in the wider environment. However, whilst it is accepted that this REP site may have some initial environmental liabilities with respect to potential soil and groundwater contamination, it is anticipated that there will be mitigation/remediation options available to enable it to be developed so that it is suitable for the proposed end use.

7.11.14 The proposed development currently includes two options for the Electrical Connection: Option 1 to Barking and Option 2 to Littlebrook. Both options require the underground routing of the Electrical Connection, and would seek to follow existing highways or corridors utilised by the existing RRRF connection if possible. In both cases, this approach is likely to avoid significant new excavations outside the existing highway footprint or make-up and therefore in respect of ground conditions the potential impacts are likely to be insignificant.

Method

7.11.15 The environmental baseline at the REP site, with reference to ground conditions, including potential soil and groundwater contamination, and ground gas, will be determined through the production of a Synopsis Phase 1 Ground Condition Assessment (GCA) that will include a review of existing information/data for the REP site and areas adjacent to it.

7.11.16 The GCA will comprise a ground stability appraisal and a Tier 1 qualitative contamination risk assessment and will confirm the likely ground conditions and environmental setting, and assess the information available to identify potential issues that may have associated environmental liabilities or affect the proposed development. The GCA will comprise (a) a desk based collection of information (b) a site and area reconnaissance and (c) reporting including a Tier 1 Qualitative Risk Assessment, preparation of a preliminary Conceptual Site Model (CSM), and preliminary land stability assessment. The identification of current and historical land use activities on and immediately off site is used to assess the likelihood for ground contamination to be present. Potential effects will be considered separately for each identified pollutant linkage such that any potential impacts are identified and mitigated as required.

7.11.17 The GCA will be undertaken in accordance with CLR 11 Model Procedures for the Management of Contaminated Land (EA, 2004), and the London Borough of Bexley Developers Guide (A Simplified Guide to Planning Applications and Land Contamination, January 2015), together with other relevant policy documents for each of the identified Local Planning Authorities within the application site (LBB, LBBD, RBG and DBC). The GCA will further identify whether additional intrusive ground investigation is required to further refine the environmental baseline. It is anticipated that there should be sufficient existing information available for the greater part of the REP site, so that extensive additional intrusive ground investigation is not anticipated to be required to inform the EIA, and that any requirement for additional ground investigation can be a requirement of the DCO.

7.11.18 The environmental baseline will then be used to assess the likely effects of REP on identified receptors such as human health, the environment and the proposed structures relating to ground conditions, and also the potential for REP to directly contribute to or to be affected by land instability and geological hazards. This assessment will form the ES chapter for ground conditions and will be undertaken in accordance with the EIA Regulations and best practice guidance such as “Guidelines for Environmental Impact Assessment”, IEMA 2004.

7.11.19 Once the GCA Report is completed, this will form the evidence base for the PEIR and ES chapter relating to ground conditions. In accordance with the requirements of the EIA Regulations, the ES chapter will identify any likely significant effects of REP on the environment, together with proposed mitigation, and description of any cumulative impacts and residual effects.

7.12 Socio-economics

Introduction

7.12.1 The Socio-economics chapter will consider potential socio-economic effects that REP may generate.

7.12.2 REP has the potential to create positive employment and business effects as well as potentially negative tourism and recreation effects during the construction and operational phases. An initial assessment of tourism and recreation effects is discussed here, providing the basis for recommendations for what should, and what does not require, to be addressed in more detail in the ES.

7.12.3 The project's construction and operational phases are considered unlikely to lead to an increase in migration and any related additional demand for housing and other local community infrastructure facilities (e.g. GPs; hospitals, dentists).

Tourism and Recreation

7.12.4 An initial review of the local tourism economy shows that as of 2017, tourism related industries[2] account for 8% of employment in Bexley, though this is lower than the Greater London average (12%). Day visits to Bexley contribute £173 million per annum, based on some 3.4 million day visits. However, compared to neighbouring authorities, Bexley has a fairly underdeveloped overnight tourism market, attracting £13m per year, or 0.5% of total tourism spend in Greater London. A negligible amount of this is related to holiday spending. Indeed, between 2008 and 2015, tourism trips have dropped dramatically (-32%), in contrast with overall growth in Greater London (+18%)[3].

7.12.5 An initial desk based review of tourism and recreational facilities in the area has identified some key receptors including, but not limited to:

- Local nature reserves including Crossness Nature Reserve which is situated adjacent to the site;
- Local visitor attractions including Crossness Pumping Station;
- A number of golf courses including Shooters Hill Gold Club, Barnehurst Golf Course, and Bexleyheath Golf Club; and
- Activity centres such as Southmere Boating Centre.

7.12.6 Other recreational receptors in the area include National Cycle Routes 1,13, 125, 136 and 137 as well as other local cycle routes and public rights of way. The Transport chapter will assess impacts on pedestrian and cycle networks.

7.12.7 Whilst there are a number of local tourism and recreational receptors in the area, the context of the proposed development is an established industrial setting with multiple tall structures present in the surrounding area. As such there are unlikely to be significant adverse impacts on nearby tourism and recreation receptors. It is proposed that assessment of tourism and recreation impacts are therefore be scoped out of the ES.

[2] Defined by Visit Britain: https://www.visitbritain.org/economic-impact-and-employment
[3] Visit Britain, *Destination Volume and Value: Local Authority Combined Analysis,* 2016. https://www.visitbritain.org/destination-specific-research

Baseline Conditions

7.12.8 Data will be collected to assess the following receptors:

- Labour market (direct and indirect employment, supply chain impacts and Gross Value Added (GVA) impacts).

Labour Market

7.12.9 Socio-economic data will be collected on drive-time catchment areas[4] from the proposed development and compared to Greater London and national averages. The baseline will provide key indicators and measures of socio-economic activity, including demographic profile, economic activity and industries of employment (including energy, construction and tourism). The assessment will also include a review of relevant economic, policy and strategy documents to establish the context for socio-economic activity and tourism and recreation in the local and wider area. An initial review of socio-economic data[5] shows the labour market area is characterised by:

- A growing population (9% from 2017-2027), slightly below anticipated growth in Greater London (11%);
- Higher levels of economic activity compared to the national average;
- An increasing dependency ratio to 2027 and to 2037[6] owing to growth in the population aged 65 and over[7];
- A slightly higher than average proportion of residents of working age (74% compared to 73% across England), but similar to that of Greater London[8];
- A highly skilled workforce[9] and education levels on a par with Greater London[10];
- Higher than average employment in in energy, utilities and resources[11] compared to Greater London; and
- Slightly higher construction employment compared to Greater London.[12]

7.12.10 The assessment will include a socio-economic profile of local, wider and regional areas based on drive time catchment areas of 30 minutes, 45 minutes and 60 minutes from REP.

Potential Environmental Effects

7.12.11 Potential environmental effects during the construction and operation phases include:

- Positive socio-economic impacts:

[4] 30 min, 45 min and 60 minutes.
[5] Experian 2017, based on 2011 Census data
[6] Based on an analysis of Experian (2017) age profiles for the wider area (including LB Bexley, LB, Barking & Dagenham, Havering, Greenwich, and Dartford).
[7] The dependent population is to increase to 133% of 2017 levels.
[8] Residents aged between 16 and 74 years old.
[9] 52% of residents in managerial, professional, associate professional or technical occupations
[10] 37% of residents holding Level 4 Qualifications and above
[11] 0.73% compared to 0.61%
[12] 6.7% compared to 6.6%

- Gross and net additional employment;
- Supply chain impacts; and
- GVA impacts.[13]

Method

7.12.12 As there is no formal guidance on the assessment of socio-economic effects, the methodology for socio-economic impact assessment is based on HM Treasury Green Book Appraisal guidance.

Study Area

7.12.13 The socio-economic study area would be as follows:

- **Socio-economic - labour market study area**: The principal socio-economic assessment is based on a 60-minute drive time catchment from the REP site. This is considered to reflect the outer limit that individuals will typically commute on a daily basis. Smaller "local area" (30-minute drive time) and "wider area" (45-minute drive time) catchments will also be used to assess the worst case scenario that labour would be sourced from much smaller areas.

Consultation

7.12.14 Key stakeholders will be contacted by email to inform the proposed socio-economic methodology and assessment. Where possible, a formal confirmation that the method is satisfactory will be obtained.

7.12.15 It is proposed that the following consultees will be contacted (depending on the final electrical connection route):

- Chambers of Commerce (South East London, Barking and Dagenham, Dartford); and
- London Economic Action Partnership.

Assessment Summary

7.12.16 The proposed content of the socio-economic ES chapter is summarised below:

- Labour Market: Scoped in.
- Tourism and Recreation Economy: Scoped out.
- Community: Scoped out

7.13 Summary and Impact Interactions

7.13.1 The EIA Regulations require consideration of the potential impact of inter-relationships of the development.

7.13.2 The EIA will consider as appropriate the potential for impact interactions leading to an aggregated environmental effect on a receptor being greater than each of the individual effects that have been identified (e.g. local people being affected by noise, dust and increased traffic

[13] Gross value added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy

levels during the construction of the development, where those impacts are greater combined than individually).

7.13.3 Potential impact interactions will be assessed within a discrete chapter of the ES.

8 Topics Not Included in the EIA Scope

8.1 Introduction

8.1.1 The ES should be focused, documenting only the assessment of likely significant environmental effects, both adverse and beneficial. Therefore, those effects which are not likely to be significant should not be included in the ES, i.e. they should be scoped out of the EIA, as clearly set out in Planning Practice Guidance (PPG) (Paragraph: 035 Reference ID: 4-035-20140306). This chapter sets out those topics that have been determined not to be significant and therefore are not included in the EIA, as well as those that will be addressed independently in separate assessments.

8.2 Risks of Major Accidents and/or Disasters

8.2.1 The EIA Regulations, under Schedule 4, part 8 require the ES to provide:

'A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned'.

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

8.2.3 Key environmental risks will be described within chapter 3 of the ES (the Proposed Development), and will provide sufficient information upon which the assessment of such issues can take place. Topic chapters within the ES will consider foreseeable risks during the construction period, from accidents such as fuel spillages and identify how the risk of such events will be minimised.

8.2.4 Alongside any development consent for the proposed development issued by the SoS, would sit an Environmental Permit issued by the Environment Agency. It is anticipated that the majority of emergency response plans and contingency measures would be dealt with through the Environmental Permit. In addition, it is considered that the Health and Safety effects arising from accidents and disasters would be dealt with through relevant industry controls.

8.2.5 Impacts to human health from emissions to air will be considered as part of the EIA, as outlined in **section 7.3** above.

8.2.6 For these reasons, it is considered that sufficient controls would be in place to ensure any effects to the environment resulting from accidents or disasters would be reduced to a level that is not significant. It is therefore considered that this can be scoped out of the ES.

8.3 Climate

8.3.1 The EIA Regulations, under Schedule 4, part 4, require the ES to consider 'Climate'. It is proposed that effects from the proposed development on Climate (contributions to greenhouse gases) will be scoped out of the EIA, and that consideration of the impact from climate change on the development from future climate change projections are considered in specific topic chapters where relevant. **Appendix H** contains a technical note which justifies this approach and sets out those topics which are proposed to consider future climate change projections.

8.4 Aviation

8.4.1 It is not a requirement under the EIA Regulations to undertake an assessment of likely impacts to aviation resulting from a proposed development.

8.4.2 National Policy Statement (EN-1) requires an assessment of potential effects to be set out in the ES when the proposed development may have an effect on civil or military aviation assets.

8.4.3 It is considered that sufficient mitigation exists, in the form of consultation with safeguarded airfields and stakeholders, appropriate aviation lighting and highlighting developments on aviation mapping. Coupled with the precedent for existing comparable structures already set in the immediate locality of the REP site, effects to aviation are not anticipated to be significant.

8.4.4 Following consultation with relevant aviation stakeholders, a standalone statement in relation to aviation will be submitted as part of the application for development consent.

8.4.5 It is therefore proposed to scope aviation out of the EIA.

8.5 Daylight and Sunlight

8.5.1 Daylight and sunlight assessments typically consider the effects of a proposed development on levels of light at neighbouring properties and outdoor amenity areas. For REP the closest residential receptors are located approximately 800 m to the south at the Travelodge London Belvedere, Hackney House and properties along Norman Road (south), North Road and Poppy Close.

8.5.2 Given the intervening distance from REP, it is not considered that there would be any loss of daylight or sunlight at the closest residential receptors. It is therefore proposed to scope daylight and sunlight out of the EIA.

8.6 Environmental Wind

8.6.1 An environmental wind assessment typically assesses the effect of a proposed development on pedestrian comfort and safety as a result of any changes to the local micro climate created by the proposed development. For REP, the relevant receptors would primarily be users of the adjacent Thames Path to the north of the Site, and users of the network of PRoWs adjacent to the site.

8.6.2 REP would introduce new massing in the form of new building and a stack. In consideration of the Lawson comfort criteria, receptors are not anticipated to be sitting or standing in the vicinity of REP, and are therefore less sensitive to higher wind speeds. Members of the public using the Thames Path and PRoWs are already exposed to potentially windy conditions including strong gusts given the open context of the environment along the river.

8.6.3 Future employees of REP, and existing employees at the existing RRRF, are not considered to be sensitive receptors in terms of environmental wind.

8.6.4 It is not considered that REP would result in significant effects to the environment in terms of environmental wind. It is therefore proposed to scope environmental wind out of the EIA.

8.7 Lighting

8.7.1 A lighting assessment would typically be undertaken as part of an EIA when there is a likelihood for significant effects to occur to light sensitive receptors.

8.7.2 The REP site is located within an existing dense urban environment which will be subject to levels of existing activity, movement and lighting in dark hours/night. The existing RRRF facility has been operating adjacent to the proposed development since 2011, with consent being granted in October 2017 for the delivery of waste by river and road on a 24/7 basis.

8.7.3 Given that the existing road network and existing jetty are in permanent operation during hours of darkness, REP is not anticipated to introduce lighting effects which would result in a significant change to the existing conditions during either the construction or operational phases.

8.7.4 Furthermore, the closest residential area of Belvedere is situated approximately 800 m to the south of the REP site, as such the opportunity for residential receptors to be affected by lighting from the REP site is limited.

8.7.5 The construction of the Electrical Connection may introduce temporary lighting effects within residential areas. However, it is envisaged that the timing of works would be limited and agreed by way of DCO Requirement, therefore preventing the opportunity for significant lighting effects.

8.7.6 Impacts from lighting on ecological receptors will be considered within the Terrestrial Biodiversity and Marine Biodiversity chapters of the ES, as outlined in **Section 7.7 and 7.8** above.

8.7.7 It is not considered that REP would result in significant effects to the environment in terms of lighting, it is therefore proposed to scope lighting out of the EIA.

8.8 Human Health

8.8.1 The EIA Regulations require human health to be considered within the EIA process. For REP, this requirement will be met through the Air Quality chapter and provision of a Health Impact Assessment (HIA) which will be appended to the ES. The ES will signpost to the HIA within an 'Other Considerations' chapter. The proposed scope of the HIA is provided at **Appendix G**. This indicates where the HIA will draw on other assessments that will be undertaken for the EIA including the air quality Human Health Risk Assessment as outlined in **Section 7.3**.

8.9 Waste

8.9.1 The EIA Regulations require (under Schedule 4, part 5d) an ES to describe the likely significant effects of the development on the environment resulting from 'the disposal and recovery of waste'.

Construction

8.9.2 It is considered that works for the preparation and clearance of the REP site will include top soil stripping along with the clearance of vegetation. It is considered that waste generated during the site preparation and clearance phase would be *de minimis,* not significant and is not proposed to be considered within the ES.

8.9.3 It is considered likely that there would be surplus material generated, in the form of spoil and made ground. In addition, there would be an element of off-cuts from construction materials. It is anticipated that the construction of the proposed development would seek to comply with the GLA's target of recycling/reusing 95% of construction, excavation and demolition (DCE&D) waste by 2020.

8.9.4 It is proposed that a draft Construction Environmental Management Plan (CEMP) will be prepared in draft to accompany the application for development consent.

Operation

8.9.5 During the operational phase, waste generate by the proposed development would consist of IBA, and APCR which would be collected and removed from the REP site.

8.9.6 IBA (approximately 25% of throughput) would be collected on the REP site, after which it would be transported by river to the Port of Tilbury for treatment and then onwards for sale and use as secondary aggregate in the construction sector.

8.9.7 APCR (approximately 3% of throughput) would be collected on the REP site, after which it would be safely removed by road in sealed containers to be processed and recycled.

8.9.8 In addition, there would likely be a small element of general waste in the form of air filters, scrap metal, insulation material, oils and chemicals and general office waste.

8.9.9 It is proposed a separate Waste Management Strategy will accompany the application. This Strategy will set the construction and operational waste management principles for the development, identifying the waste expected to arise and the proposed routes for managing those arisings.

9 Summary and Next Steps

9.1 Summary

9.1.1 This document has been prepared to provide an overview of the likely significant environmental effects that have been considered in scoping the EIA for REP.

9.1.2 This scoping report provides information regarding REP, sets out the intended EIA scope and methodologies for the assessment of likely significant environmental effects, and outlines the content of the ES.

9.1.3 The aim is to ensure that REP has due regard for the environment, mitigates adverse environmental effects where possible, and takes advantage of opportunities for environmental enhancement.

9.2 The Environmental Statement

9.2.1 The outcome of the EIA process is the production of an ES to accompany the DCO application. An ES will be prepared in compliance with the EIA Regulations, and that:

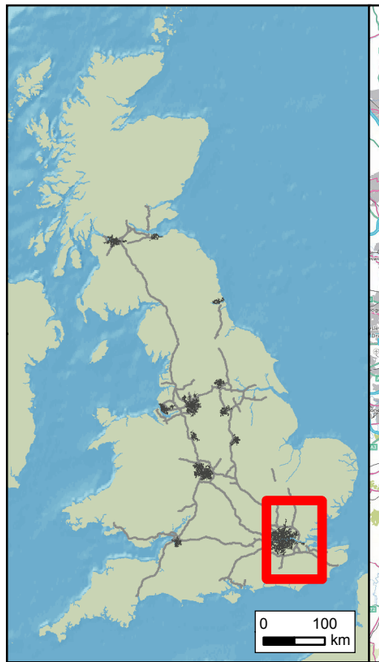
- Describes the proposed development;
- Outlines the reasonable alternatives considered;
- Describes the baseline environment;
- Describes the likely significant effects and the methods used to identify significant effects;
- Describes the measures to mitigate adverse effects;
- Describes any monitoring arrangements; and
- Includes a non-technical summary.

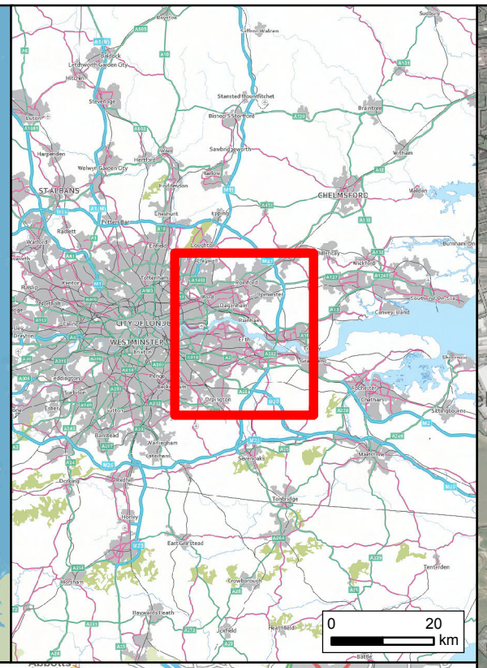
9.3 Next Steps

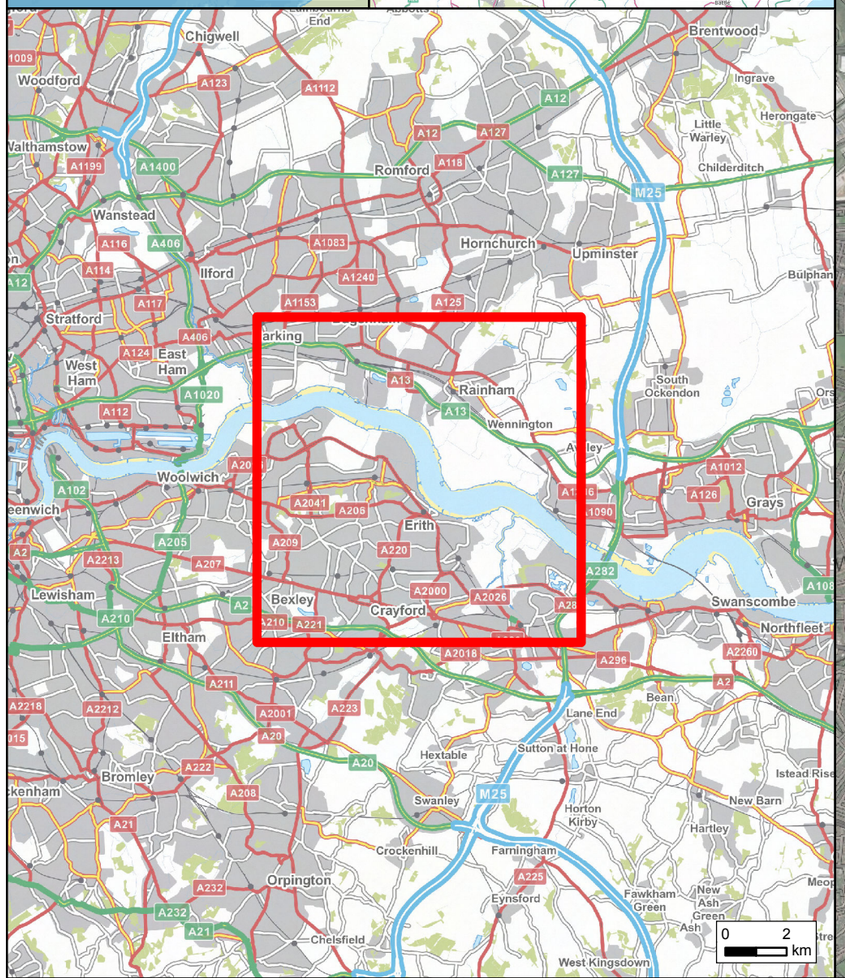
9.3.1 The next steps in the EIA process are as follows:

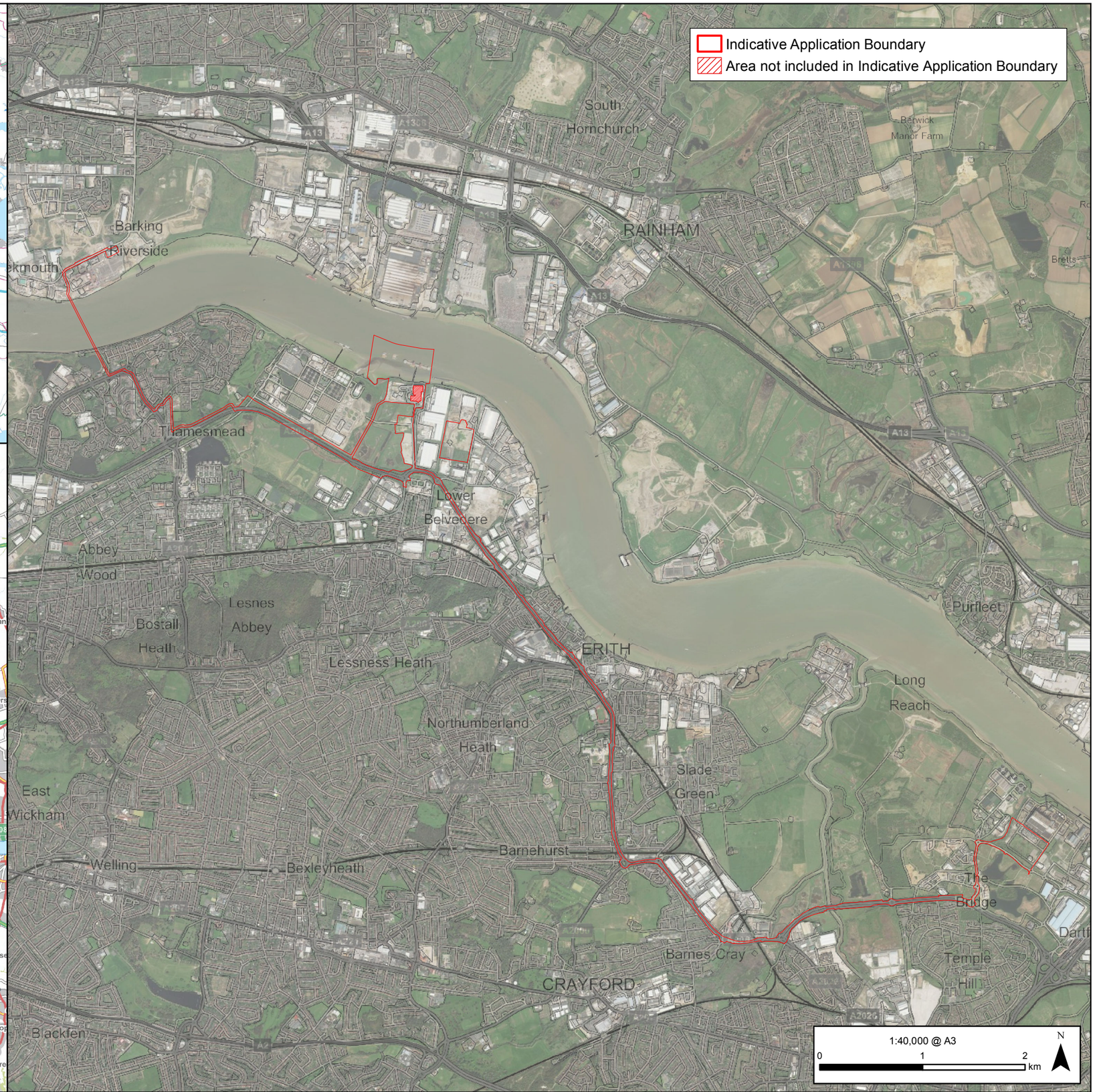
- Receipt of formal Scoping Opinion;
- Formal consultation on PEIR; and
- Submission of ES with the DCO application.

Appendix A Site Location Plan









RIVERSIDE ENERGY PARK

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Contains Ordnance Survey data © Crown copyright and database right 2016

pba peterbrett

Client: CORY RIVERSIDE ENERGY

27/11/17
Drawn: DRL
Checked: SC

Site Location Plan

Figure 01 | Rev A

Document Path: Z:\Projects\42166\02_mxd\42166_00_SiteLocationPlan.mxd

Appendix B Indicative Application Boundary

Indicative Application Boundary

Area not included in Indicative Application Boundary

RIVERSIDE ENERGY PARK

0 0.75 1.5 km

Client

CORY RIVERSIDE ENERGY

1:30,000 @ A3

27/11/17

Drawn: CM

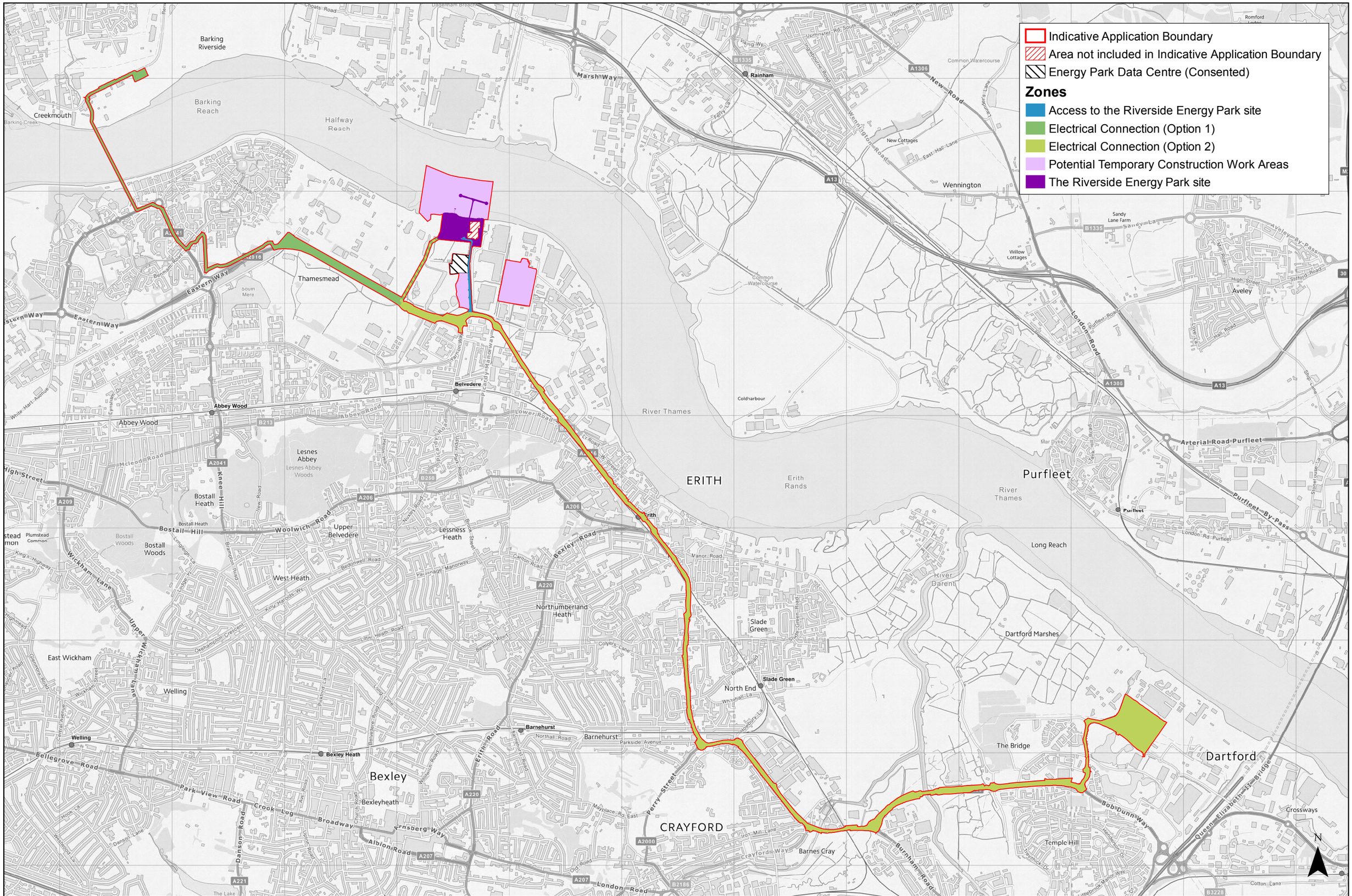
Checked: JM

Indicative Application Boundary

Figure 1b | Rev A

Document Path: Z:\Projects\42166\02_mxd\42166_01_IndicativeRedlineBoundaryC.mxd

Appendix C Indicative Zoning Plan



RIVERSIDE ENERGY PARK

0 0.75 1.5 km

pba peterbrett

Client: CORY RIVERSIDE ENERGY

1:30,000 @ A3
27/11/17
Drawn: DRL
Checked: SC

Indicative Zoning Plan

Figure 1c | Rev A

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Appendix D Regulation 10, 14 (part 1) and Schedule 4 of the EIA Regulations

Regulation 10 extracted from the EIA Regulations

1) A person who proposes to make an application for an order granting development consent may ask the Secretary of State to state in writing their opinion as to the scope, and level of detail, of the information to be provided in the environmental statement.

(2) A person who proposes to make a subsequent application may ask the relevant authority to state in writing its opinion as to the scope, and level of detail, of the further information to be provided in the updated environmental statement.

(3) A request under paragraph (1) must include—

(a) a plan sufficient to identify the land;

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

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

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

(4) A request under paragraph (2) must include—

(a) the reference number of the order granting development consent in respect of which the applicant proposes to make a subsequent application;

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

(c) an explanation of the likely significant effects of the development on the environment which were not identified at the time the order granting development consent was made; and

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

(5) When the Secretary of State or the relevant authority, as the case may be, has received a request for a scoping opinion under paragraph (1) or (2), they must, if they consider that they have not been provided with sufficient information to adopt an opinion, notify in writing the person making the request of the points on which they require additional information.

(6) The Secretary of State or the relevant authority must not adopt a scoping opinion in response to a request under paragraph (1) or (2) until they have consulted the consultation bodies, but must, subject to paragraph (7), within 42 days beginning with the date of receipt of that request, or where they have notified the person making the request that they require additional information in order to adopt an opinion, within 42 days of receiving that information, adopt a scoping opinion and send a copy to the person who made the request.

(7) Where a person has, at the same time as making a request for a screening opinion under regulation 8(1), asked the Secretary of State for a scoping opinion under paragraph (1), and the Secretary of State has adopted a screening opinion to the effect that the development is EIA development, the Secretary of State must, within 42 days beginning with the date on which that screening opinion was adopted or, where the Secretary of State has notified the person making the request that they require additional information in order to adopt an opinion, within 42 days of receiving that information, adopt a scoping opinion and send a copy to the person who made the request.

(8) Where a person has, at the same time as making a request for a subsequent screening opinion under regulation 8(2), asked the relevant authority for a scoping opinion under paragraph (2), and the relevant authority has adopted a subsequent screening opinion to the effect that an updated environmental statement is required to enable it to determine a subsequent application, the relevant authority must, within 42 days beginning with the date on which the subsequent screening opinion was adopted or, where it has notified the person making the request that it requires additional information in order to adopt an opinion, within 42 days of receiving that information, adopt a scoping opinion and send a copy to the person who made the request.

(9) Before adopting a scoping opinion the Secretary of State or the relevant authority must take into account—

(a) any information provided about the proposed development;

(b) the specific characteristics of the development;

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

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

(10) When the Secretary of State or the relevant authority has adopted a scoping opinion in response to a request under paragraph (1) or (2), neither the Secretary of State nor the relevant authority shall be precluded from requiring of the person who made the request additional information in connection with any statement that may be submitted by that person as an environmental statement or an updated environmental statement in connection with an application for an order granting development consent or a subsequent application for the same development as was referred to in the request.

(11) If a consultation body does not within 28 days of being consulted under paragraph (6) respond stating—

(a) the information it considers should be provided in the environmental statement or the updated environmental statement; or

(b) that it does not have any comments, the Secretary of State or the relevant authority is entitled to assume that the consultation body in question does not have any comments on the information to be provided in the environmental statement or the updated environmental statement.

Regulation 14 (part 1) extracted from the EIA Regulations

(1) An application for an order granting development consent for EIA development must be accompanied by an environmental statement.

(2) An environmental statement is a statement which includes at least—

(a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development;

(b) a description of the likely significant effects of the proposed development on the environment;

(c) a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;

(e) a non-technical summary of the information referred to in sub-paragraphs (a) to (d); and

(f) any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.

Schedule 4 extracted from the EIA Regulations, setting out the required information for inclusion in the ES.

(1) A description of the development, including in particular:

(a) a description of the location of the development;

(b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;

(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;

(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.

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

(3) A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

(4) A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.

(5) A description of the likely significant effects of the development on the environment resulting from, inter alia:

(a) the construction and existence of the development, including, where relevant, demolition works;

(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;

(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

(g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in regulation 5(2) should cover

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

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

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

(8) A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive (c) or Council 2009/71/Euratom (d) or UK environmental assessments may be used for this provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

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

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

Appendix E Table of Organisational Experience

EIA Topic	Organisation	Relevant Expertise
EIA Coordination	Peter Brett Associates LLP	Peter Brett Associates LLP (PBA) is a founder member of the Institute of Environmental Management and Assessment's (IEMA) EIA Quality Mark scheme for quality in EIA. PBA has a dedicated EIA team that specialises in leading the EIA process for development projects, including land development, regeneration, energy and infrastructure projects. Each of PBA's EIA team have suitable academic and professional qualifications, with professional qualifications including Principal EIA Practitioner, Practitioner and Associate membership of IEMA, member of Royal Town Planning Institute and Chartered Environmentalist.
Townscape and Visual	Peter Brett Associates LLP	PBA has a dedicated townscape team that specialises in undertaking townscape and visual impact assessments and appraisals for development schemes, including land development, regeneration, energy and infrastructure projects. PBA's townscape team includes experienced staff, who have relevant academic and professional qualifications, including those who are a Chartered Member of the Landscape Institute (CMLI). In addition, PBA is a Registered Practice of the Landscape Institute and a corporate member of IEMA. The TVIA chapter will be prepared by a chartered landscape architect (CMLI) at PBA.
Noise and Vibration	Peter Brett Associates LLP	The chapter will be prepared by Peter Brett Associates LLP (PBA), sponsor members of the Institute of Acoustics (IOA). PBA has a dedicated acoustics team that specialises in undertaking noise and vibration assessments for development projects, including land development, regeneration, energy and infrastructure projects. PBA typically undertakes in excess of 150 noise and vibration assessments each year. All of PBA's acoustics team have suitable academic and professional qualification, including being registered with the IOA.
Air Quality	Peter Brett Associates LLP	The chapter will be prepared by Peter Brett Associates LLP (PBA). PBA has a dedicated air quality team that specialises in undertaking air quality assessments for development projects, including land development, regeneration, energy and infrastructure projects. PBA typically undertakes in excess of a hundred air quality assessments each year. All of PBA's air quality team have suitable academic and professional qualification, including being registered with the Institution of Environmental Sciences (IES) and Institute of Air Quality Management (IAQM).
Socio-Economics	Peter Brett Associates	PBA has a dedicated planning economics team that specialises in undertaking economic profiling

EIA Topic	Organisation	Relevant Expertise
	LLP	assessments, economic impact assessments and economic appraisals for development schemes, including land development, regeneration and infrastructure projects. PBA's Planning team includes experienced staff, who have relevant academic and professional qualifications, including those who are chartered members of the Royal Institution of Charted Surveyors (RICS) and Royal Town Planning Institute (RTPI), and members of the Institute of Economic Development (IED). In addition, PBA is a corporate member of RICS and the IED. The SEIA chapter will be prepared by members with these qualifications at PBA.
Archaeology and Cultural Heritage	Orion Heritage	Orion Heritage Limited is an archaeological and heritage consultancy with over 50 years collective experience. The company provides independent advice to the private sector aimed at resolving the often conflicting demands of heritage conservation while also achieving profitable and sustainable development. The Directors bring with them a wealth of experience of providing advice to clients on all stages of the promotion and construction of proposed developments. This ranges from land acquisition/due diligence, through the design and planning application (both outline and detailed) process, to the eventual discharge of archaeological and historic building conditions. This work routinely involves the production of desk-based assessments and historic environment ES chapters for TCP and NSIP schemes, negotiations with local planning authorities, the costing and management of archaeological investigations, and expert witness at public inquiry. Each of Orion's EIA team have suitable academic qualifications professional accreditation (Associate or Member of the Chartered Institute for Archaeologists) and a wealth of EIA experience.
Transport	Peter Brett Associates LLP	PBA has a dedicated transport team that specialises in undertaking transport planning, modelling and appraisal for development schemes, including land development, regeneration and infrastructure projects. PBA's transport team includes experienced staff, who have relevant academic and professional qualifications, including those who hold Transport Planning Professional (TPP) and those who are Chartered Members of the Institute of Highways and Transportation (CMIHT). In addition, PBA holds corporate membership of the Transport Planning Society (TPS) and the Chartered Institute of Highways and Transport (CIHT).
Terrestrial Biodiversity	Peter Brett Associates LLP	PBA Ecology Team works collaboratively with our clients and wider project teams to provide robust and pragmatic ecological advice to support projects through the planning process. Our extensive experience allows us to liaise effectively with

EIA Topic	Organisation	Relevant Expertise
		stakeholders and to determine cost-effective mitigation solutions, aligned with policy and legislative requirements. All members of PBA's ecology team are members of CIEEM (the Chartered Institute of Ecology and Environmental Management), with some more senior members of the team also holding Chartered Ecologist status. As such, we are bound by the Code of Professional Conduct, as set out by CIEEM, in all aspects of the ecological work we do.
Hydrology and Flood Risk	Peter Brett Associates LLP	PBA has a designated Water Management team with many years of experience in, amongst other areas, the assessment of flood risk, hydrology and hydraulic modelling, flood management, the Water Framework Directive, surface water drainage and river engineering. PBA's Water Management team includes experienced staff who have relevant academic and professional qualifications, The authors and reviewers of the document are all experienced engineers and members of chartered institutions such as the Chartered Institution of Water and Environmental Management (CIWEM) and/or the Institution of Civil Engineers (ICE).
Ground Conditions	Peter Brett Associates LLP	PBA has a dedicated geoenvironmental and geotechnical team that specialises in the investigation and assessment of ground conditions for a variety of project types and land development schemes. This includes the assessment of potentially contaminated land, geotechnical and land stability assessments, and the preparation of Environmental Impact Assessments. PBA's geo team includes a variety of experienced and qualified staff who have relevant academic and professional qualifications, including those who are Chartered Engineers, Scientists, Environmentalists and Geologists.
Marine Geomorphology	ABPmer	ABPmer is a specialist marine consultancy with a long history of providing a wide range of advice and support to those wishing to obtain planning permissions, marine licences and consents offshore and at the coast. This includes undertaking supporting assessments such as EIA, HRA, WFD and MCZ as well as stakeholder engagement. Recent experience has ranged across a number of sectors including renewable energy, port developments, aggregates, inter-connectors and habitat creation schemes. ABPmer operates a quality management system (QMS), which is certified to ISO 9001:2015, for the delivery of Environmental Consultancy and Research Services and has the IEMA EIA Quality Mark. ABPmer's environment team includes a variety of experienced and qualified staff who have relevant academic and professional qualifications including those who are Chartered Environmentalists, full members of IEMA, CIEEM and Institute of Fisheries

EIA Topic	Organisation	Relevant Expertise
		Management.
Marine Ecology	ABPmer	ABPmer is a specialist marine consultancy with a long history of providing a wide range of advice and support to those wishing to obtain planning permissions, marine licences and consents offshore and at the coast. This includes undertaking supporting assessments such as EIA, HRA, WFD and MCZ as well as stakeholder engagement. Recent experience has ranged across a number of sectors including renewable energy, port developments, aggregates, inter-connectors and habitat creation schemes. ABPmer operates a quality management system (QMS), which is certified to ISO 9001:2015, for the delivery of Environmental Consultancy and Research Services and has the IEMA EIA Quality Mark. ABPmer has dedicated numerical modelling and physical processes teams which include a variety of experienced and qualified staff who have relevant academic and professional qualifications including those who are Chartered Environmentalists, Chartered Marine Scientists and full members of CIWEM and IMAREST.
Health	Peter Brett Associates LLP	PBA are part of the Institute of Environmental Management and Assessment's (IEMA) working group on health, which forms part of their wider Impact Assessment Network. The group is set up to advance the newly established practice of assessing health in EIA. PBA have been undertaking Health Impact Assessments (HIA) for over 10 years, typically undertaking approximately 5 HIA a year. Practitioners are members of IEMA and are experienced at undertaking EIA and HIA and coordinating with the relevant technical input leads. Practitioners stay abreast of technical practice through attendance at appropriate seminars, conferences and use of appropriate online tools and discussion forums.
Waste	Peter Brett Associates LLP	PBA has worked within the waste management arena for over 20 years and has a dedicated team of professionals who provide expertise in waste policy, waste planning, waste options appraisals and waste technology issues. The team has variety of experienced and qualified staff who have relevant academic and professional qualifications, including those who are Chartered Waste Managers through the Chartered Institute of Waste Management (CIWM) and the Chartered Institution of Water and Environmental Management (CIWEM).
Cumulative Effects and Impact Interactions	Peter Brett Associates LLP	Peter Brett Associates LLP (PBA) is a founder member of the Institute of Environmental Management and Assessment's (IEMA) EIA Quality Mark scheme for quality in EIA. PBA has a dedicated EIA team that specialises in leading the

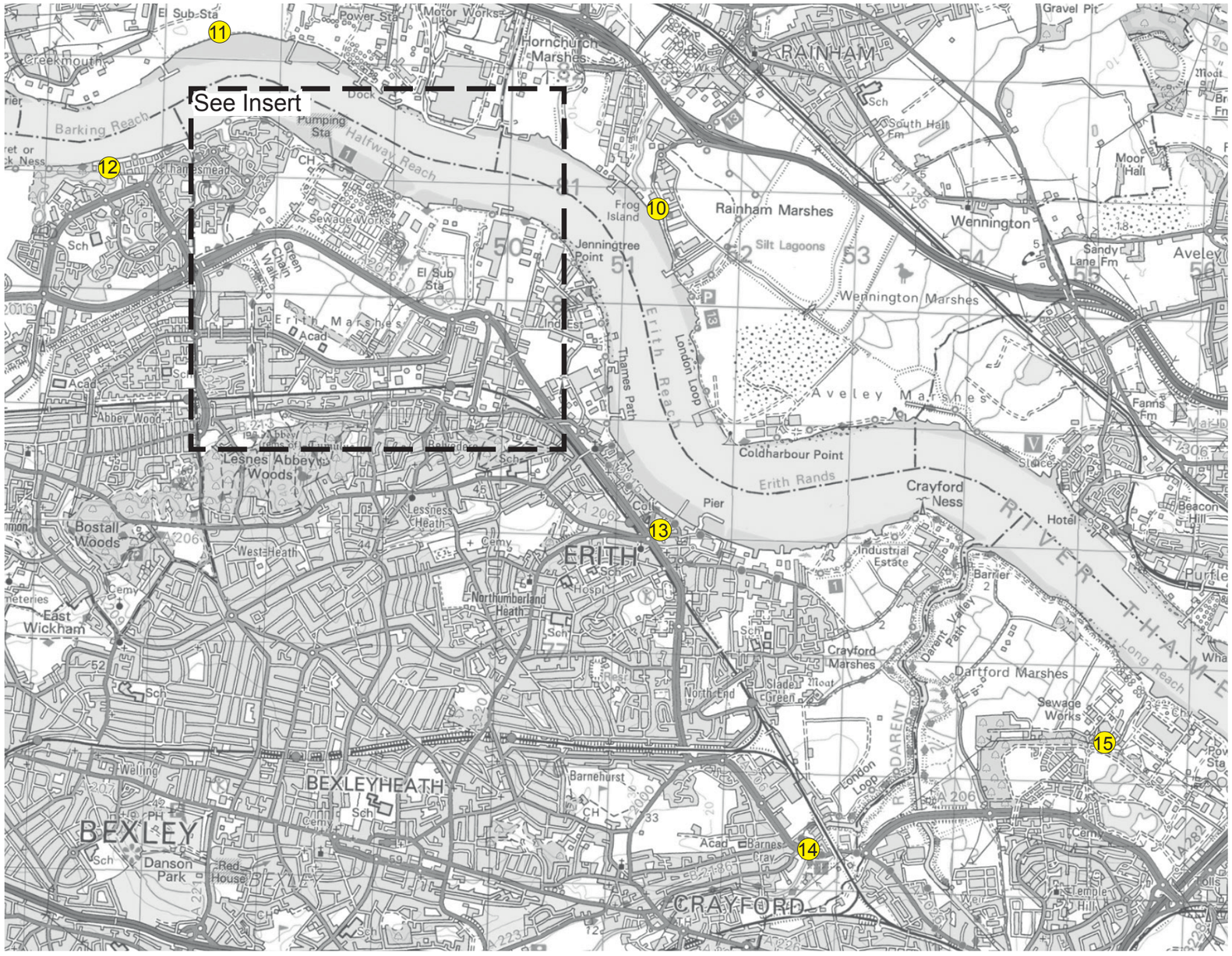
EIA Topic	Organisation	Relevant Expertise
		EIA process for development projects, including land development, regeneration, energy and infrastructure projects. Each of PBA's EIA team have suitable academic and professional qualifications, with professional qualifications including Principal EIA Practitioner, Practitioner and Associate membership of IEMA, member of Royal Town Planning Institute and Chartered Environmentalist.

Appendix F Proposed Viewpoint Locations

LEGEND

Sequential Visual Assessment (east and west)

1 Preliminary Viewpoint Locations for Visual Assessment



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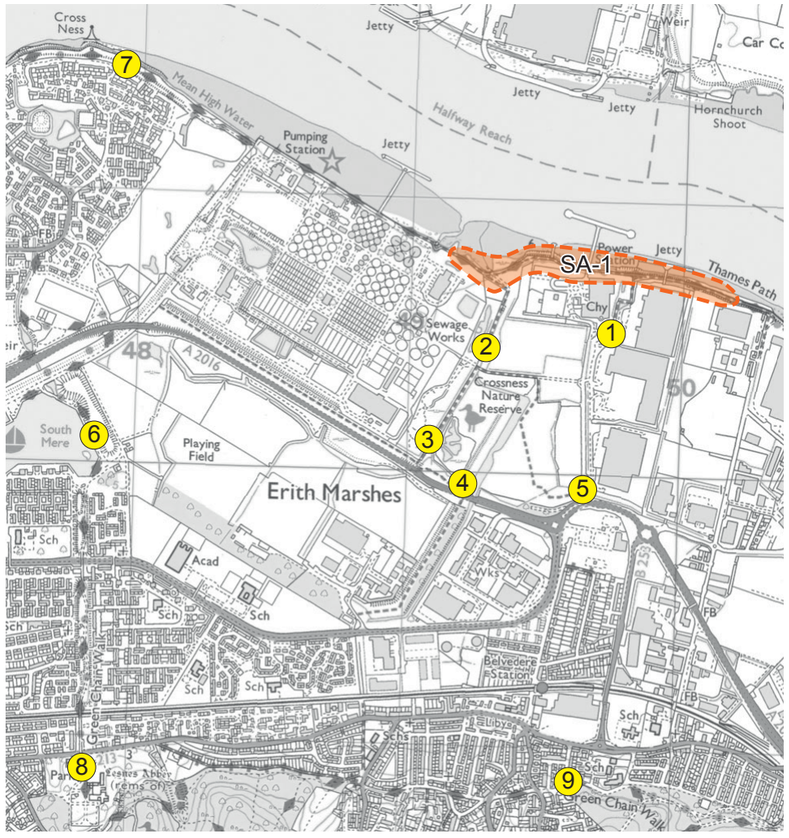

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RIVERSIDE ENERGY PARK, BELVEDERE

PRELIMINARY VIEWPOINTS PLAN: TVIA, SCOPING REPORT

CORY RIVERSIDE ENERGY

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Rev letter	Rev A	SL	14	11	17

Drawing Number	Revision		
42166-3002-01A		Date	02.11.17
		Scale	AS SHOWN
		Drawn	SL
		Checked	NJ

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Appendix G Proposed Scope of Health Impact Assessment

To: **Scoping Consultees**

Date: **15th November 2017**

Prepared by: **Peter Brett Associates**

Subject: **Health Impact Assessment Scoping Memo**

1. Introduction

1.1 The Environmental Impact Assessment (EIA) Regulations 2017 require human health to be considered within the EIA process.

1.2 For the Riverside Energy Park development (the "Project"), this requirement will be met through provision of a Health Impact Assessment (HIA) which will be appended to the Environmental Statement (ES). The ES will signpost to the HIA in an 'Other Considerations' Chapter.

1.3 The HIA will draw on the findings of technical chapters of the ES which assess effects relevant to human health as indicated in Table 1 below. In particular, a Human Health Risk Assessment will be presented within the Air Quality Chapter.

1.4 The approach to HIA will involve a desk-top investigation of health impacts and will be undertaken by PBA.

1.5 Health within the HIA will be defined as *"a state of complete physical, social and mental wellbeing and not simply the absence of disease or infirmity."* (World Health Organization; Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June 1946, and entered into force on 7 April 1948).

2. Baseline Conditions

2.1 The site lies within Belvedere Ward in the London Borough of Bexley. It is immediately adjacent to Thamesmead East Ward and Lesnes Abbey Ward is to the south. Collectively, these wards are referred to as the Belvedere Geographic region.

2.2 The residential area of Belvedere lies approximately 800 m to the south with a population of approximately 11,890. The residential area of Abbey Wood lies approximately 1,950 m south west with a population of approximately 15,700, and the residential area of Thamesmead lies approximately 1,560 m west, with a population of approximately 32,000.

2.3 Overall, the borough is fairly affluent with lower unemployment than the London average and the health of people in Bexley is generally better than the England average. However, the wards noted above have some of the highest levels of deprivation in the borough, in particular in Thamesmead East Ward. Deprivation often indicates where health inequalities lie. Health priorities in Bexley include obesity (adult and children), diabetes, dementia, addiction (smoking), substance misuse, and children and young people's emotional wellbeing.

2.4 Within the HIA, a review will be undertaken to establish the characteristics of the human populations that may be affected by the Project (refer to description of receptors in Method section below) and local priorities for health which are relevant to the Project. Data will be aggregated to an appropriate level (e.g. Ward/Borough) where available and compared to the national context.

2.5 Information to be reviewed, to establish the baseline, will include:

- London Borough of Bexley Joint Strategic Needs Assessment, 2016;

- A Health and Wellbeing Strategy for Bexley (London Borough of Bexley and Bexley Clinical Commissioning Group);
- Public Health England Bexley Health Profile, 2017;
- Labour market statistics as also identified in socio-economics chapter e.g. Nomis;
- Bexley Core Strategy adopted February 2012;
- Public Health England Local Health Information;
- Fair Society, Healthy Lives: A Strategic Review of Health Inequalities in England Post-2010 ('The Marmot Review') (2010);
- Healthy Urban Planning Checklist 3rd Edition (NHS London Healthy Urban Development Unit) April 2017;
- National Planning Policy Framework, 2012 and relevant Planning Practice Guidance;
- Consultation with the public and stakeholders (discussed in the Method section below);
- Baseline for other relevant topics in the EIA (refer to para **Table 1** below).

3. Potential Effects

3.1 As part of the basis for HIA, it is recognised that health and wellbeing can be affected by multiple determinants as indicated in **Figure 1**.

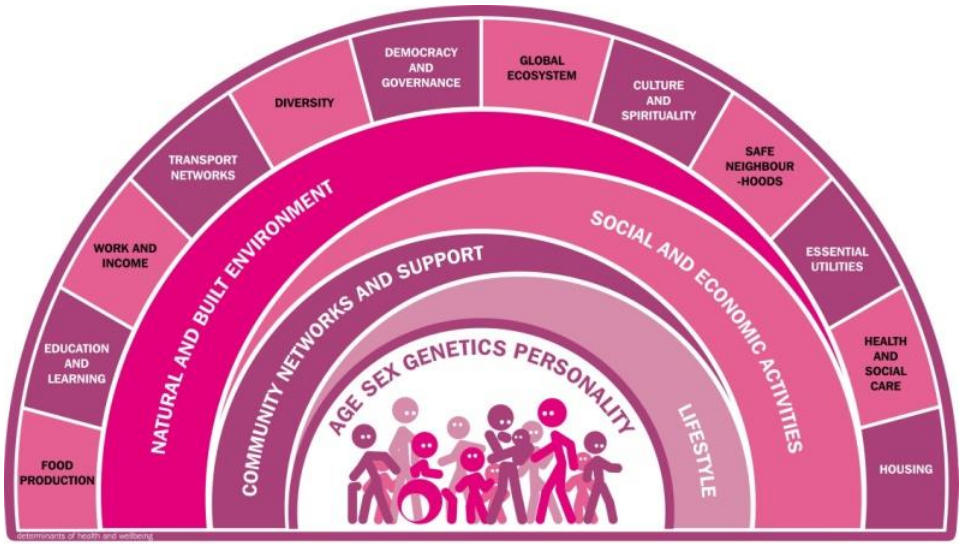

Figure 1: The Determinants of Health and Wellbeing (Peter Brett Associates (Adapted from Dahlgren G and Whitehead (1991). Policies and strategies to promote social equity in health; Institute of Future Studies; Stockholm)).

3.2 In planning for the Project it is understood that health is not only about avoiding harm through compliance with safety measures, but also through avoiding environmental pollution and contributing to the factors that improve wellbeing. This will include access to jobs and issues of energy security. It is however recognised that the opportunities for healthy place-making may not be as great for a development of this type as, for instance, planning the regeneration of a town centre or the development of a significant area of new housing.

3.3 Using the information gathered from the baseline and from consultation, the HIA will establish a set of 'health and wellbeing objectives', tailored to the local context and the Project. Whilst it is acknowledged that this is not an urban project (which would include proposed residential dwellings), at this stage, the structure of the Healthy Urban Planning Checklist from London's Healthy Urban Development Unit has been used as a basis to provide a framework for consideration of determinants. The potential for the project to affect the determinants is noted in **Table 1** below which forms the proposed scope of health issues for the Project.

Table 1 Scoping Health Issues

Theme	Planning issue	Scoping	Links to ES Topics
Healthy Housing	Housing design and accessible housing	Scoped out	Scoped out
	Healthy living	Excess deaths are recorded in winter due to cold housing conditions associated with fuel poverty, which particularly affects the elderly. The Project has the potential to have a beneficial effect on energy supply and security in the long term.	Links to wider application
	Housing mix and affordability	Scoped out	Scoped out
Active travel	Promoting Walking and Cycling.	Levels of walking and cycling can affect physical activity, which in turn can affect mental and physical health outcomes including prevalence of cardiovascular disease and obesity. The Project has the potential to disrupt existing walking and cycling routes (e.g. the Thames Path) during construction but also to promote walking and cycling for new employees at Riverside Energy Park.	Transport (refer to Section 7.2 of ES Scoping Report)
	Safety	Transport accidents and safety have direct links to health and injury. The Project has the potential to affect the volume of traffic on the wider network and therefore transport accidents will be considered.	Transport (refer to Section 7.2 of ES Scoping Report)
	Connectivity	Connectivity can affect the ability of people to access services and social networks and can encourage walking and cycling – with associated mental health and physical health outcomes. The Project has potential effects on the connectivity of existing transport routes during construction and also the connectivity of workers to their place of employment and surrounding facilities.	Transport (refer to Section 7.2 of ES Scoping Report)
	Minimising car use	Links with health will be considered with respect to walking and cycling (as noted above) and air quality (as noted below).	Transport, Air Quality (refer to Sections 7.2 and 7.3 of ES Scoping Report)

Theme	Planning issue	Scoping	Links to ES Topics
Healthy environment .	Air Quality	Poor air quality is linked to incidence of chronic lung disease (chronic bronchitis or emphysema) and heart conditions and asthma levels among children. The Project has the potential to affect air quality through construction activities, transport emissions and waste combustion.	Air Quality (refer to Section 7.3 of ES Scoping Report)
	Odour	Foul odours can cause stress and anxiety and can prevent people using outdoor spaces for physical activity and relaxation. There are potential odour impacts from the receipt and processing of waste.	Air Quality (refer to Section 7.3 of ES Scoping Report)
	Noise	Noise pollution can have a detrimental impact on health resulting in sleep disturbance, cardiovascular and psycho-physiological effects. The Project has the potential to affect noise and vibration levels during both construction and operation.	Noise and Vibration (refer to Section 7.4 of ES Scoping Report)
	Contaminated land and water	Contamination of land and water bodies poses direct health risks due to toxicity from inhalation and ingestion of pollutants. The Project has the potential to disturb existing contamination, increase the deposition of metals to soil and contaminate water resources.	Ground Conditions; Air Quality; Hydrology, Flood Risk and Water Resources (refer to Section 7.11, 7.3 and 7.10 of ES Scoping Report)
	Biodiversity / Open space	Access to open/green space and nature can lead to more physical activity and reduce levels of heart disease, strokes and other ill-health problems that are associated with both sedentary and stressful lifestyles. No significant effects on publicly accessible natural spaces are anticipated, therefore this is scoped out of assessment. However, any effects on assets, such as the Thames Path, will be considered within the promotion of walking and cycling.	Terrestrial Biodiversity, Transport (refer to Section 7.7 and 7.2 of ES Scoping Report)
	Play space / local food growing	Scoped out	Scoped out
	Flood Risk	Flood risk of the Project will be considered with respect to energy security and safety of workers.	Hydrology, Flood Risk and Water Resources (refer to Section 7.10 of ES Scoping Report)

Theme	Planning issue	Scoping	Links to ES Topics
	Visual Amenity	Attractive neighbourhoods contribute to a 'sense of place' and wellbeing. Evidence shows that people are more likely to walk and cycle in attractive spaces. Visually intrusive features can cause stress. The Project has the potential to affect the visual amenity of the area for residents and pedestrians.	Townscape and Visual (refer to Section 7.5 of ES Scoping Report)
Vibrant neighbourhoods	Healthcare services	Scoped out	Scoped out
	Education	Education increases employment opportunities and the capacity to earn, while integrating learning about the importance of a healthy lifestyle including exercise and diet. The Project has the potential to affect training opportunities. Where educational facilities are considered as receptors to other affects e.g. noise / air quality – these will be considered.	Socio-economics, Noise and Vibration, Air Quality (refer to Sections 7.12, 7.4 and 7.3 of ES Scoping Report)
	Social cohesion / Access to social infrastructure	Social capital is associated with better levels of health, better educational attainment, better chances of employment and lower crime rates. The Project has the potential to involve the local community to maintain social cohesion e.g. through the Belvedere Community Forum.	Socio-economics (refer to Section 7.12 of ES Scoping Report)
	Crime reduction and community safety	Mental illness exacerbated through isolation, lack of social contact and fear of crime. The Project has the potential to affect the fear of crime in particular through the introduction of construction workers at the site.	Links to wider application
	Local employment and healthy workplaces	Access to employment can have an effect on both physical and mental health through enhanced social integration, self-esteem, physical activity and income. The Project has the potential to affect local employment levels both during construction and operation.	Socio-economics (refer to Section 7.12 of ES Scoping Report)
	Access to local food shops	Scoped out	Scoped out
	Public buildings and spaces	Scoped out	Scoped out

4. Method

4.1 The final set of health and wellbeing objectives will be used as the basis of a systematic assessment of the emerging development proposals. They will be used to test the Project and identify where action should be taken to avoid adverse effects, as well as to secure potential benefits.

4.2 Given the multidisciplinary nature of HIA and the political, economical, technical and practical considerations which feed into the judgement of significance, it is not considered appropriate to develop significance criteria for human health within the EIA generic significance criteria framework (i.e. minor, moderate and major categories). Therefore, to assist decision making and to ensure that the health assessment is not inconsistent with the EIA, effects will be categorised solely into significant and not significant effects. Significant likely effects will be reported where there is likely to be an unmitigated effect on the physical, social or mental wellbeing of a group of receptors (outlined below). These will be categorised into long term and short term effects. Where significant effects are reported for environmental disciplines assessed in the EIA, which use health criteria as their basis e.g. air quality / contamination / noise / transport, these will be reviewed in relation to this health threshold.

Receptors and Vulnerable Groups

4.3 The HIA will identify likely significant effects of the Project on the health of:

- Existing residents and communities in the local area. This will include residents in Belvedere, Thamesmead and Lesnes Abbey Wards but may also include those across the River Thames and the wider area if effects are anticipated;
- Receptors within proposed communities i.e. consented planning applications;
- Community users identified for assessment within the ground conditions, noise, air quality, transport and visual amenity assessments e.g. schools / care homes / pedestrians; and
- Construction workers and workers at the operational site. Although it should be noted that health and safety of workers does not fall within the remit of the HIA, it will reference where risks are addressed.

4.4 The temporal scope of the assessment will consider impacts as necessary at construction and also of the Project once complete. The future baseline will be considered which will include receptors in proposed communities and how the health of existing and proposed communities may change in the future e.g. due to climate change.

4.5 The HIA will also look at how different groups are likely to be affected in different ways, and therefore how health and social inequalities might be reduced or widened by the Project, with a particular focus on vulnerable groups that may be inequitably affected by the development. Given the nature of the Project, these are likely to include younger and older people in the existing local residential communities, and those that are unemployed. It is not anticipated that the Project will have any disproportionate effects on those with disabilities, so this vulnerable group will be scoped out of the assessment.

Consultation

4.6 The process of preparing the proposals will include consultation and engagement with the local population, stakeholders for the Boroughs, as well as technical consultation related to the assessment of environmental effects. It is not intended to undertake any specific consultation for the HIA (other than through the EIA scoping process), but to integrate health and community issues into the wider consultation programme.

Major Accidents and Disasters

4.7 Consideration of major accidents and disasters in relation to human health has been proposed to be scoped out of assessment. Refer to Section 8.2 of the ES Scoping Report

Monitoring

4.8 Where significant effects are identified on human health, a schedule of proposed monitoring will be proposed within the ES.

Appendix H Climate Change Technical Note

Climate Change Scoping Memo
Riverside Energy Park

To:	**Scoping Consultees**
Date:	**22/9/17**
Prepared By:	**Jonathan Riggall**
Subject:	**Climate Change Scoping Memo**

Introduction

The following technical note sets out Peter Brett Associates LLP's (PBA) approach to the assessment of climate change within the Environmental Impact Assessment (EIA) for Riverside Energy Park.

This technical note focuses on the application of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('the EIA Regulations 2017') requiring:

5. A description of the likely significant effects of the development on the environment resulting from:

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

There is no national or European guidance on the application of 5 (f) (Schedule 4) of EIA Regulations 2017.

The Institute of Environmental Management and Assessment (IEMA) has produced two guidance documents[1] on the assessment of the impact from and to development from climate change. The documents do not give definitive approaches to the scoping of climate change and do not give guidance on the assessment of significance.

This note sets out PBA's suggested approach to screening and scoping climate change based on the EIA Regulations 2017 and takes into consideration the IEMA Guidance.

This note does not set out the science, relationship or justification relating to the link between greenhouse gas (GHG) emissions and climate change.

[1] EIA Guide to Climate Change Resilience and Adaptation (November 2015)
EIA Guidance on assessing greenhouse gas emission and significance

Screening and Scope of Climate Change for Riverside Energy Park

The screening of the technical assessment of climate change falls into two separate parts which are different both in nature, methodology and outcome.

1. The first consideration is the impact from climate change on the development based on future climate change projections.

2. The second consideration is the impact of the development on climate change.

These are considered separately below.

1. Impacts from future climate change scenarios

Overarching National Policy Statement for Energy EN-1, Section 4.8 sets out the need to consider the effects of climate change on the development. This requirement is also noted in National Policy Statement for Renewable Energy Infrastructure EN-3, Section 2.3.

Linked to climate change, future potential adverse weather may have direct and indirect impacts on the Riverside Energy Park development. Future climate change predictions are provided through the UK Climate Change Projections (CP09) a service provided by the Environment Agency and the UK Met office.

The future weather scenarios form part of the future baseline scenario which the EIA topic assessments will need to consider. Table 1.1 below sets out how it is proposed that the technical chapters that will consider changing weather scenarios in the Environmental Statement (ES), with justification of the proposed approach.

ES Subject	Screening requirement	Justification
Air quality	No	Waste incineration directive (200/76/EC) and Industrial Emissions Directive (2000/76/EC) appraise emissions and set requirements for future emission predictions.
Transport	No	Impact of weather on transport outside the site is beyond the control of the development and not proportional to the development scale
Noise & Vibration	No	Weather unlikely to impact the noise and vibration effects of the development
Biodiversity	Yes	Weather variations may impact species and habitats on site and within the local area.
Water (hydrology and hydrogeology)	Yes	Weather patterns may impact flood risk
Ground Conditions	No	Weather unlikely to impact geological environment
Townscape and Visual Impact Assessment	No	Weather unlikely to impact townscape and visual impact beyond effects on habitats (addressed through Biodiversity)
Historic Environment	No	Weather variations are not considered to impact historic assets
Socio-economics	No	Impact of weather on socio-economic factors outside the site is beyond the control of the development control and not proportional to the development scale
Health	Yes	Changing weather patterns have the potential to impact human health onsite.
Waste	No	Weather is unlikely to impact waste generated from the construction or operation of Riverside Energy Park

2. Impacts on Climate Change

The IEMA guidance identifies a direct correlation between GHG emissions and climate change. It suggests therefore the impact of a development on climate change should be based on its potential to emit greenhouse gases.

The IEMA guidance also notes that any GHG emissions should be considered significant.

The guidance also notes that whilst there is a consensus that greenhouse gases contribute to global warming, the science behind global warming is far greater than just atmospheric quantum of greenhouse gases.

This is important when considering whether the assessment of GHG emissions at a local level is proportionate to the complexity of an assessment of climate science and its associated global variables.

The proportionality of the EIA is a key consideration to ensure the ES is measured in its scope; the requirement of the EIA Regulations is that the EIA should be focused on "likely significant effects" only, and not all effects of development. For impact on climate change the IEMA guidance references proportionality against the context of the development in National, Sector and Local GHG emissions.

A carbon emission assessment has been completed for the existing Riverside Resource Recovery Facility (RRRF), which was reviewed and ratified by the Carbon Trust on 1st March 2017[2]. The study showed that the energy from waste plant provides a carbon saving of 212kg CO_2 per tonne of waste when compared to the counterfactual end waste disposal route of landfill.

From a national, sector and local GHG emissions perspective the study shows a positive impact in reducing GHG emission, when compared to a landfill alternative.

Based on the above consideration of GHG emissions, a proportional assessment would conclude there to be no significant increases in emissions compared to an alternative of landfilling.

The IEMA guidance suggests where there is unlikely to be an impact above the defined context that a qualitative assessment of GHG emissions would be appropriate.

In light of the development having a limited impact on the national, sector and local context, and therefore is not likely to have a significant effect on climate change, we have scoped the impact on climate change out of the EIA. However, a qualitative assessment of GHG emissions will be undertaken and submitted as an appendix to the Design and Access Statement.

[2] http://www.coryenergy.com/carbon-efficiency/less-carbon/