

National Grid
Cable Tunnel Replacement
Project

Environmental Statement
Volume II
Chapter 1 Introduction

December 2023



Quality information

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1 Introduction

1.1 Introduction

1.1.1 National Grid Electricity Transmission (hereafter National Grid) has developed proposals for the replacement of a cabled section of the Tilbury to Grain and Tilbury to Kingsnorth (TKRE) 400 kV circuits under the River Thames. The TRKE 400 kV circuits are currently predominantly overhead line, with a cabled section installed within a deep tunnel beneath the River Thames. The TKRE Cable Tunnel Replacement Project (hereafter 'the Proposed Development') relates only to the tunnelled section of these circuits and the infrastructure required to transition from overhead line to underground cables.

1.2 Overview of the Cable Tunnel Replacement Project

1.2.1 It is proposed that a **new bored tunnel** under the River Thames is constructed to house new cross linked polyethylene (XLPE) cables.

1.2.2 The Proposed Development comprises the following above-ground components at both ends of the new tunnel:

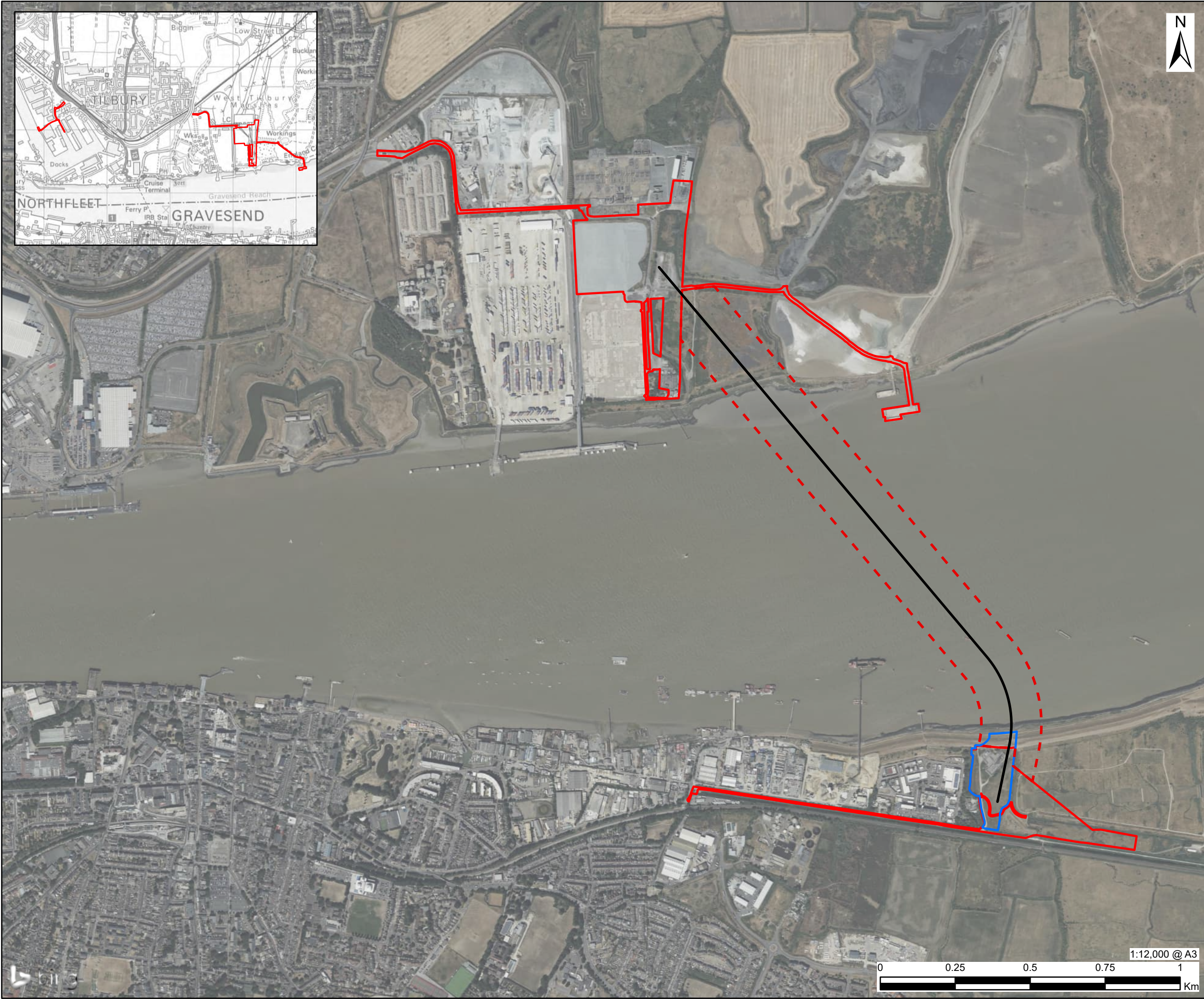
- **A new cable sealing end compound:** consisting of:
 - **a new tunnel headhouse** which will cover the shaft into the tunnel;
 - **a new overhead line gantry structure** which will connect the overhead line downlead conductors and transfer them to six sealing end structures; and
- **Modifications to the existing overhead line (OHL):** The new OHL conductors will be connected to the existing TKRE 400kV OHL conductors via new terminal pylons. The old OHL conductors and existing pylons will be either replaced, refurbished or removed.

1.2.3 Figure 1-1 provides a site location plan.

1.3 Project Need

1.3.1 National Grid owns and operates the national high-voltage electricity transmission system throughout England and Wales. The key role of the transmission system is to connect the electricity generators' power stations with the local distribution networks of the regional electricity companies. National Grid holds the Transmission Licence for England and Wales and is thus obligated to develop and maintain an efficient, co-ordinated and economical system of electricity transmission and to facilitate competition in the generation and supply of electricity, as set out in the Electricity Act 1989 (Ref 1-2).

1.3.2 The Proposed Development is part of the Ofgem's new Accelerated Strategic Transmission Investment (ASTI) framework (published December 2022) (Ref 1-3). Under this framework, National Grid is responsible for delivering the extensive onshore transmission system enhancements that are required to achieve the government's 2030 power sector decarbonisation target.



AECOM

PROJECT

TKRE Cable Tunnel Replacement Project

CLIENT

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LEGEND

- Planning Application – Red Line Boundary (Above Ground)
- Indicative Tunnel Alignment
- Planning Application – Red Line Boundary (Below Ground)
- National Grid Land Ownership

NOTES

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ISSUE PURPOSE

Environmental Statement

PROJECT NUMBER

60677311

FIGURE TITLE

Site Location Plan

FIGURE NUMBER

Figure 1.1

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- 1.3.3 National Grid's operations are dictated by the latest Future Energy Scenarios (FES) (Ref 1-4) and Electricity Ten Year Statement (ETYS) reports (Ref 1-5). In recent years, these reports have begun forecasting a large amount of renewable and low carbon energy generation, connecting into the transmission network in the east coast of England, together with three interconnectors from the continent. Through these forecasts, National Grid Electricity System Operator (ESO) has identified that the Tilbury to Grain and Tilbury to Kingsnorth (TKRE) 400 kilovolt (kV) circuits will be significantly overloaded in their current capacity and require uprating. National Grid has named this wider project: 'Tilbury to Grain'.
- 1.3.4 Each year, the ESO undertakes an assessment of the options National Grid has available for meeting forecasted energy demands (the Network Options Assessment, NOA) (Ref 1-6). This assessment comprises economic analysis to understand the balance between managing power flows across network boundaries. In the most recent NOA (2021/22), the ESO has recommended investment in upgrading the TKRE 400 kV circuits giving the project a 'proceed' signal with an Earliest in Service Date (EISD) of 2028. This was reconfirmed in the NOA refresh published July 2022.
- 1.3.5 As the Transmission Licence Holder with responsibility for the TKRE circuits, National Grid is required to upgrade the existing circuits.

1.4 The Consenting Team

- 1.4.1 This Environmental Statement has been co-ordinated, prepared and reviewed by AECOM on behalf of National Grid. AECOM is registered to the EIA Quality Mark, which is a scheme operated by the Institute of Environmental Management and Assessment (IEMA) that allows organisations (both developers and consultancies) that lead the co-ordination of statutory EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed.

1.5 Approach to Consenting

Requirement for EIA

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

- 1.5.1 EIA Development is defined in The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 as either:
- Schedule 1 development for which EIA is mandatory; or
 - Schedule 2 development for which EIA may be required taking account factors such as the Proposed Development's nature, size or location.
- 1.5.2 The Proposed Development does not fall within the definition of Schedule 1 development.
- 1.5.3 Schedule 2 development is defined by the EIA Regulations as:
- "Development of a description mentioned in Column 1 of the table in Schedule 2¹ where:*
- any part of that development is to be carried out in a sensitive area²; or*
 - any applicable threshold or criterion in the corresponding part of Column 2 of that table is respectively exceeded or met."*
- 1.5.4 The closest description for the Proposed Development within Schedule 2 is Category 10(b) 'urban development', which the relevant corresponding threshold reads are as follows:

¹ <https://www.legislation.gov.uk/uksi/2017/571/schedule/2/made>

² A Sensitive Area is defined as land designated as a National Park, Site of Special Scientific Interest (SSSI), Area of Outstanding Natural Beauty (AONB), UNESCO World Heritage Site (WHS), Scheduled Monument or European Protected Site.

“In the case of Urban Development Projects,

- i. the development includes more than 1 hectare of development which is not dwelling house development; or*
- ii. the development includes more than 150 dwellinghouses; or*
- iii. the area of the development exceeds 5 hectares.”*

- 1.5.5 The Proposed Development would exceed the threshold set at 10(b)(i) because it would consist of more than 1 hectare of development (at approximately 1.1 hectares (ha)) which is not dwellinghouse development. Therefore, an EIA Screening Opinion was sought from Thurrock Council and Gravesham Borough Council to determine whether the development is likely to give rise to likely significant environmental effects on its own or cumulatively with other developments.
- 1.5.6 On 7 July 2023, Thurrock Council confirmed through their screening opinion that the Proposed Development would not be considered EIA development.
- 1.5.7 On 3 August 2023, Gravesham Borough Council confirmed through their screening opinion that the Proposed Development is considered EIA development.
- 1.5.8 Due to the opposing views of Thurrock Council, and Gravesham Borough Council regarding if the Proposed Development constituted EIA development, National Grid decided to consider the whole project as EIA development and this is discussed in further detail at a paragraph 1.6.

The Marine Works (Environmental Impact Assessment) Regulations 2007

- 1.5.9 Of interest to the Marine Management Organisation (MMO) is the proposed boring of new tunnel. The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) (Ref 1-7) set out the procedure that must be followed before approval is granted for a range of plans and projects. These require an EIA to be carried out in support of an application for consent for categories of project listed in Schedule A1 and Schedule A2 of the Regulations.
- 1.5.10 The boring of a new tunnel does not fall under Schedule A1 or Schedule A2 of the EIA Regulations. However National Grid requested an EIA Screening opinion to confirm if the MMO consider a statutory EIA is required. On 1 August 2023, the MMO requested National Grid withdraw their EIA screening application, advising that an EIA screening request is only for projects which fall under either Schedule A1 or A2 of the Marine Works (Environmental Impact Assessment) Regulations 2007 (Ref 1-8), which the MMO did not believe the Proposed Development fell under.
- 1.5.11 A marine licence is not required as the new tunnel meets the terms of a Marine Licence Exemption set out in Article 35 of the Marine Licensing (Exempted Activities) Order 2011 (Ref 1-9).

Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017

- 1.5.12 Development requiring EIA is defined in Schedule 1 of The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017 (Ref 1-8) as:
- “1. Development to provide any of the following—*
- (a) a nuclear generating station;*
 - (b) a thermal generating station with a heat output of 300 megawatts or more;*
 - (c) an electric line installed above ground with—*
 - (i) a voltage of 220 kilovolts or more; and*
 - (ii) a length of more than 15 kilometres.*
- 1.5.13 The Proposed Development falls within the definition of Schedule 1 (c)(i), as it would be at a voltage of 400kV but does not meet the length threshold of 15 km Schedule 1 (c) (ii). Therefore, the Proposed Development does not meet the criteria in Schedule 1. The modifications to the existing overhead lines are consented via Section 37 of the Electricity Act 1989 and, although described in this

Environmental Statement, do not form part of the Town and Country Planning Act planning application. A Section 37 consent application will be sought from DESNZ.

Planning Permission

- 1.5.14 National Grid is seeking to secure full planning permission for specific elements of the Proposed Development by way of a planning application under the Town and Country Planning Act 1990 to Thurrock Council for the proposed new cable tunnel, tunnel head house and SEC. The Planning Application will also allow for construction compounds associated with these works.
- 1.5.15 For the equivalent works south of the River Thames (Gravesend) National Grid is seeking to secure full planning permission for specific elements of the Proposed Development by way of a planning application under the Town and Country Planning Act 1990 to Thurrock Council for the proposed new cable tunnel, tunnel head house and SEC.

Table 1-1: Summary of Primary Consenting Regimes

Project Compound	Primary Consent	Determining Authority
Permanent Work at Tilbury		
New Cable Tunnel, Sealing End Compound and Tunnel Headhouse	Full Planning Permission, Town and Country Planning Act 1990 (TCPA) (as amended) (Ref 1-10)	Thurrock Council
Permanent Work at Gravesend		
New Cable Tunnel, Sealing End Compound and Tunnel Headhouse	Full Planning Permission, Town and Country Planning Act 1990 (TCPA) (as amended) (Ref 1-10)	Gravesham Borough Council
New Bored Tunnel		
New Bored Tunnel	Full Planning Permission, Town and Country Planning Act 1990 (TCPA) (as amended) (Ref 1-10)	Thurrock Council jurisdiction
	Full Planning Permission, Town and Country Planning Act 1990 (TCPA) (as amended) (Ref 1-10)	Gravesham Borough Council
	No consent required (Section 35 of The Marine Licensing (Exempted Activities) Order 2011 (Ref 1-11)).	Marine Management Organisation (MMO)
Overhead Line Works and reconfiguration (at Tilbury and Gravesend)		
Overhead Line Works and reconfiguration	Section 37 Consent under the Electricity Act 1989 (Ref 1-11)	Department of Energy Security and Net Zero (DESNZ)

1.6 Purpose and Structure of the Environmental Statement

- 1.6.1 The Proposed Development has been Screened under The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Of the Environmental Impact Assessment (EIA) screening opinions provided by Thurrock Council (23/00681/SCR) and Gravesham Borough Council (20230668) (ES Volume VI Appendix 4.1), only Gravesham Borough Council determined the Proposed Development to be EIA. Thurrock Council determined the Proposed Development to be 'not EIA Development'.
- 1.6.2 The whole of the Proposed Development has been considered as EIA Development and this statutory Environmental Statement (ES) provides the information required by the 2017 Regulations.

- 1.6.3 The purpose of this ES is to support the planning applications for the Proposed Development by describing the proposed development, documenting the assessment of its likely significant effects on the environment, and detailing the mitigation measures proposed to prevent, reduce or offset significant adverse effects.
- 1.6.4 The ES describes the process and outcomes in the consideration of environmental effects and is undertaken in a concise, and objective manner in order to provide stakeholders with sufficient information regarding environmental effects and any mitigation requirements.
- 1.6.5 The ES is presented in six volumes, as follows:
- **Volume I: Non-Technical Summary;** this is intended to be readily accessible to the general public. It is concise and written in non-technical language providing a description of the Proposed Development, a summary of the assessment of likely significant environmental effects and proposed mitigation measures.
 - **Volume II: Front End Chapters;**
 - **Chapter 1 Introduction:** introduces the Proposed Development and explains the consenting strategy and ES structure adopted;
 - **Chapter 2 Alternatives:** provides a description of the reasonable alternatives studied by National Grid which are relevant to the Proposed Development and its specific characteristics, and the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment;
 - **Chapter 3 Project Description:** provides a detailed description of the key design components and characteristics of the Proposed Development; and outlines the planned timescales for construction and implementation;
 - **Chapter 4 Environmental Impact Assessment Methodology:** summarises the screening and scoping process undertaken to establish the scope of the environmental documentation, the adopted approach to the environmental assessment and format of the individual technical appraisals;
 - **Chapter 5 Consultation:** summarises stakeholder consultation undertaken during the options and environmental assessment phases;
 - **Chapter 6 Planning Policy:** summarises relevant national and local planning policy.
 - **Volume III: Tilbury Technical Chapters**
 - **Chapter 7 to 14 Technical Appraisals:** report the findings of the detailed environmental impact assessments of the Proposed Development within Tilbury;
 - **Volume IV: Gravesend Technical Chapters**
 - **Chapter 12 to 22 Technical Appraisals:** reports the findings of the detailed environmental impact assessments of the Proposed Development within Gravesend;
 - **Volume V:**
 - **Chapter 23 Cumulative Effects:** describes the consideration of cumulative impacts that may arise owing to interaction with other developments (“cumulative effects”) and summarises combined effects arising as a result of the Proposed Development (“combined effects”);
 - **Chapter 24 Summary:** An overall summary of likely significant effects from the Proposed Development; and
 - **Volume VI: Technical Appendices** containing detailed information supporting technical assessments in Volumes III and IV.

Table 1-2: Environmental Statement Structure

Chapter Number	Title
Volume I Non-Technical Summary	
Volume II Front End Chapters	
CH01	Introduction
CH02	Alternatives
CH03	Project Description
CH04	Environmental Impact Assessment Methodology
CH05	Consultation
CH06	Planning Policy
Volume III Tilbury Technical Chapters	
CH07	Biodiversity
CH08	Landscape and Visual
CH09	Historic Environment
CH10	Traffic and Transport
CH11	Noise and Vibration
CH12	Air Quality
CH13	Water Environment
CH14	Materials and Waste
Volume IV Gravesend Technical Chapters	
CH15	Biodiversity
CH16	Landscape and Visual
CH17	Historic Environment
CH18	Traffic and Transport
CH19	Noise and Vibration
CH20	Air Quality
CH21	Water Environment
CH22	Materials and Waste
Volume V Cumulative Effects and Summary	
CH23	Cumulative Effects Assessment
CH24	Summary
Volume VI Technical Appendices	
Appendix 3.1	Outline Construction Environmental Management Plan
Appendix 4.1	EIA Screening Opinions
Appendix 4.2	EIA Screening Opinion Project Responses
Appendix 4.3	Competent Expert Evidence
Appendix 7.1	Preliminary Ecological Appraisal
Appendix 7.2	Ornithology Baseline Report
Appendix 7.3	Great Crested Newt (GCN) eDNA Surveys
Appendix 7.4	Bat Survey Report
Appendix 7.5	Otter and Water Vole Survey Report
Appendix 7.6	Badger Survey Report (Confidential)
Appendix 7.7	Reptile Survey Report
Appendix 7.8	Invertebrate Report

Chapter Number	Title
Appendix 7.9	National Vegetation Classification Survey Report
Appendix 7.10	Marine Assessment Screening
Appendix 8.1	Landscape Character Assessment Tables (Tilbury)
Appendix 8.2	Visual Assessment (Tilbury)
Appendix 9.1	Historic Environment Desk Based Assessment
Appendix 9.2	Desk-based Geoarchaeological Deposit Modelling Report
Appendix 9.3	Written Scheme of Investigation for Geoarchaeological Deposit Modelling and Borehole Survey
Appendix 10.1	Outline Construction Traffic Management Plan
Appendix 10.2	Abnormal Load Assessment Report
Appendix 10.3	Transport Statement Note (Tilbury)
Appendix 10.4	Transport Scoping Meeting Minutes (Tilbury)
Appendix 10.5	Receptor Sensitivity Levels (Tilbury)
Appendix 10.6	Baseline Traffic Movements (Tilbury)
Appendix 10.7	Preliminary Highway Impact Assessment (Tilbury)
Appendix 10.8	Magnitude of Change (Tilbury)
Appendix 10.9	Assessment of Construction and Decommissioning Phases (Tilbury)
Appendix 10.10	Cumulative Assessment (Tilbury)
Appendix 11.1	Human Hearing and Acoustic Terminology
Appendix 11.2	Baseline Noise and Vibration Monitoring Report
Appendix 11.3	Noise and Vibration Calculations and Modelling
Appendix 12.1	Detailed Air Quality Assessment Methodology
Appendix 12.2	Detailed Dispersion Modelling Methodology
Appendix 13.1	Water Framework Directive (WFD) Assessment
Appendix 16.1	Landscape Character Assessment Tables (Gravesend)
Appendix 16.2	Visual Assessment Tables (Gravesend)
Appendix 18.1	Transport Statement Note (Gravesend)
Appendix 18.2	Transport Scoping Meeting Minutes (Gravesend)
Appendix 18.3	Receptor Sensitivity Levels (Gravesend)
Appendix 18.4	Baseline Traffic Movements (Gravesend)
Appendix 18.5	Construction Worker Trip Distribution (Gravesend)
Appendix 18.6	Preliminary Highway Impact Assessment (Gravesend)
Appendix 18.7	Magnitude of Change (Gravesend)
Appendix 18.8	Assessment of Construction and Decommissioning Phase (Gravesend)
Appendix 18.9	Cumulative Assessment (Gravesend)
Appendix 23.1	Cumulative Assessment Long and Short List of Other Developments

1.7 Other Supporting Documents

- 1.7.1 There are also a number of other documents which form part of the planning applications in addition to the ES, as detailed below in Table 1-3. The ES cross refers to these other documents within the planning application and vice versa.

Table 1-3: Supporting Documents for the Planning Applications

Document Title	Description
Planning Statements (Tilbury and Gravesend)	Identified the context and need for the proposed development and includes an assessment of how the proposed development accords with relevant national, regional and local planning policies.
Design and Access Statement (Tilbury and Gravesend)	A short report accompanying and supporting the planning application which explains the design principles and concepts that have been applied to the development and demonstrates how the developments context has influenced its design.
Planning Drawings (Tilbury and Gravesend)	Sets out the location of the Proposed Development and its various constituent components as per the drawing standard of the relevant Planning Authority validation requirements.
Land Contamination Preliminary Risk Assessments (Tilbury and Gravesend)	These Stage 1, Tier 1 Preliminary Risk Assessment identify potential land quality liabilities and contamination risks at the sites. Potential liabilities and risks in this context may derive from: - Contamination due to past and current uses of the site and surrounding land, in the context of the environmental sensitivity of the site setting; - Changes in land use; and - Potential natural ground hazards and constraints associated with the local ground conditions.
Report to inform Habitat Regulations Assessment (HRA)	This report assists the competent authority in completing its HRA.
Biodiversity Net Gain (BNG) Assessment and Strategy Report	BNG Statutory requirements do not apply to the Proposed Development. However, National Grid is committed to making a positive contribution to biodiversity net gain and is making a voluntary commitment. This report quantifies the overall effect of the Proposed Development on biodiversity value compared to the baseline situation using Biodiversity Metric 4.0 in accordance with the accompanying guidance and best practice principles. The report sets out the results of the BNG assessment including the methodology and National Grid's strategy to reach a minimum of 10% BNG net gain.
Flood Risk Assessment	This report considers planning provisions, sources of flood risk, site-specific flood risk and flood risk strategy for the tunnel shafts, sealing end compounds and tunnel associated with the Proposed Development. The report reviews the risks associated with the Proposed Development, assessing the sources of flood risk to the Proposed Development as well as the impact of the Proposed Development on flood risk elsewhere.
Drainage Management Strategy	This report presents information relating to the below ground drainage scheme design and Surface Water (Pluvial) flooding flow protection measures for the two SEC locations.
Flood Warning and Evacuation Plan (Tilbury and Gravesend)	This Plan sets out what "site users" will do in the event of flood, it is primarily concerned with their safety.
Baseline Tree Survey Report and Arboricultural Impact Assessment	The Baseline Tree Survey Report will set out the results of the arboricultural survey including a schedule of surveyed trees. This will be accompanied by a Tree Constraints Plan – showing the above and below ground spatial constraints associated with surveyed tree features. The Arboricultural Impact Assessment identifies the likely direct and indirect impacts of the proposed development on trees and vice versa.
Statement of Community Involvement	This report explains how the local community have been consulted on the proposals for the Proposed Development and how their comments have been taken in to account.

1.8 References

Ref 1-1 *HM Government (2017)*. The Town and Country Planning (EIA) Regulations 2017. Available at: <https://www.legislation.gov.uk/ukxi/2017/571/contents/made>

Ref 1-2 *HM Government (1989)*. The Electricity Act 1989. Available at: <https://www.legislation.gov.uk/ukpga/1989/29/contents>

Ref 1-3 *Ofgem (2022)*. Accelerated Strategic Transmission Investment (ASTI) framework. Available at: <https://www.ofgem.gov.uk/publications/decision-accelerating-onshore-electricity-transmission-investment>

Ref 1-4 *National Grid ESO (2023)*. Future Energy Scenarios. Available at: <https://www.nationalgrideso.com/document/283101/download>

Ref 1-5 *National Grid ESO (2022)*. Electricity Ten Year Statement. Available at: <https://www.nationalgrideso.com/document/275611/download>

Ref 1-6 *National Grid ESO (2021/22)*. Network Options Assessment. Available at: <https://www.nationalgrideso.com/research-and-publications/network-options-assessment-noa>

Ref 1-7 *HM Government (2007)*. Marine Works (Environmental Impact Assessment) Regulations 2007. Available at: <https://www.legislation.gov.uk/ukxi/2007/1518/contents/made>

Ref 1-8 *HM Government (2017)*. The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017. Available at: <https://www.legislation.gov.uk/ukxi/2017/580/contents/made>

Ref 1-9 *HM Government (2011)*. Marine Licensing (Exempted Activities) Order 2011. Available at: <https://www.legislation.gov.uk/ukxi/2011/409/contents/made>

Ref 1-10 *HM Government (2017)*. The Town and Country Planning Act 1990. Available at: <https://www.legislation.gov.uk/ukxi/2017/571/contents/made>

Ref 1-11 *HM Government (2017)*. The Marine Licensing (Exempted Activities) Order 2011. Available at: <https://www.legislation.gov.uk/ukxi/2011/409/contents/made>

1.9 Abbreviations

Abbreviation	Meaning
ASTI	Accelerated Strategic Transmission Investment
DESNZ	The Department for Energy Security and Net Zero
EIA	Environmental Impact Assessment
EISD	Earliest in Service Date
ES	Environmental Statement
ESO	Electricity System Operator
ETYS	Electricity Ten Year Statement
FES	Future Energy Scenarios
GCN	Great Crested Newts
IEMA	Institute of Environmental Management and Assessment
kV	Kilovolt
MMO	Marine Management Organisation
NOA	Network Options Assessment
OHL	Overhead Line
SEC	Sealing End Compound
TCPA	Town and Country Planning Act
TKRE	Tilbury to Grain and Tilbury to Kingsnorth
XLPE	Cross Linked Polyethylene

