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GATEWAY ENERGY CENTRE

2019 ENVIRONMENTAL STATEMENT

FURTHER INFORMATION DOCUMENT

GATEWAY ENERGY CENTRE
2019 ENVIRONMENTAL STATEMENT
FURTHER INFORMATION DOCUMENT

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APPENDIX A: 2019 UPDATED FLOOD RISK ASSESSMENT

APPENDIX B: 2019 TRANSPORT REPORT ADDENDUM

LIST OF ABBREVIATIONS

AADT	Annual Average Daily Traffic
AGI	Above Ground Installation
AQMA	Air Quality Management Area
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
BEIS	Department for Business, Energy and Industrial Strategy
BESS	Battery Energy Storage System
CCGT	Combined Cycle Gas Turbine
CCR	Carbon Capture Readiness
CCS	Carbon Capture and Storage
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CO	carbon monoxide
CO ₂	carbon dioxide
COMAH	Control of Major Accident Hazards
COSHH	Control of Substances Hazardous to Health
DCLG	Department for Communities and Local Government
DCS	Distributed Control System
DEFRA	Department for Environment, Food and Rural Affairs
DEMP	Decommissioning Environmental Management Plan
EIA	Environmental Impact Assessment
ES	Environmental Statement
ES FID	Environmental Statement Further Information Document
ETS	Emissions Trading Scheme
FRA	Flood Risk Assessment
GCN	Great Crested Newts
GEC	Gateway Energy Centre
GECL	Gateway Energy Centre Limited
ha	hectares
HRSG	Heat Recovery Steam Generator
HSE	Health and Safety Executive
LCV	Lower Calorific Value
LDO	Local Development Order
LNR	Local Nature Reserve
LPA	Local Planning Authority
NNR	National Nature Reserve
NOX	nitrogen oxides
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRTF	National Road Traffic Forecast
NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptor
NVQ	National Vocational Qualification
OCGT	Open Cycle Gas Turbine
OS	Ordnance Survey
PM	particulate matter
PRA	Preliminary Risk Assessment
RS	Regional Strategy
SAC	Special Area of Conservation
SAM	Scheduled Ancient Monument

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SO ₂	sulphur dioxide
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TEMPRO	Trip End Model Presentation Programme
TTGDC	Thurrock Thames Gateway Development Corporation

1. INTRODUCTION

1.1 Overview

- 1.1.1 In August 2011, the Original Consent was granted for the Gateway Energy Centre (GEC) under Section 36 of the Electricity Act 1989. Subsequently, in November 2014 and August 2016, the consent was varied (the 2014 Varied Consent and the 2016 Varied Consent, respectively) under Section 36C of the Electricity Act 1989. The 2016 Varied Consent is the existing consent for GEC.
- 1.1.2 Gateway Energy Centre Limited (GECL) is submitting the 2019 Variation Application under Section 36C of the Electricity Act 1989, to the Secretary of State for Business, Energy and Industrial Strategy (the Secretary of State) via the Department for Business, Energy and Industrial Strategy (BEIS), to vary the existing consent for GEC (the Development or the Proposed Development).
- 1.1.3 This Section provides a summary of the consenting history for GEC, a description of the 2019 Variation Application (and a summary of the required content of a variation application), the purpose of this document and a summary of the other associated authorisations granted and to be sought.

1.2 Consenting History for Gateway Energy Centre

- 1.2.1 In February 2010, GECL (a wholly owned subsidiary of InterGen) submitted an application for consent under Section 36 of the Electricity Act 1989 to construct a 900 MW Combined Cycle Gas Turbine (CCGT) generating station to be known as GEC.

The application also sought a direction that planning permission be deemed to be granted under Section 90 of the Town and Country Planning Act 1990.

Together, the Original Application.

- 1.2.2 In terms of environmental documentation / studies, the application was accompanied by:

- The February 2010 Environmental Statement (the February 2010 ES), comprising:
 - A Non-Technical Summary;
 - Volume 1: Main Text;
 - Volume 2: Appendices; and,
 - Volume 3: Figures.
- A Carbon Capture Readiness (CCR) Feasibility Study;
- A Combined Heat and Power (CHP) Assessment; and,
- A Design and Access Statement.

- 1.2.3 Following submission of the application, consultation responses were received, and meetings were held with key consultees from which clarifications on the application were sought and supplementary information requested. In December 2010, GECL submitted the clarifications and supplementary information.

- 1.2.4 In terms of the environmental documentation / studies, the clarifications and supplementary information included:

- The December 2010 Environmental Statement Further Information Document (December 2010 ES FID), comprising:
 - A Non-Technical Summary;
 - Volume 1: Main Text; and,
 - Volume 2: Figures.
- A Supplementary CHP Assessment;

- A Supplementary Design and Access Statement;
 - A Supplementary Flood Risk Assessment (FRA);
 - A Supplementary Planning Statement; and,
 - A Transport Report.
- 1.2.5 On 4 August 2011, Consent under Section 36 of the Electricity Act 1989 was granted and a direction that planning permission be deemed to be granted under Section 90 of the Town and Country Planning Act 1990 was made (the Original Consent and the 2011 Deemed Planning Permission).
- 1.2.6 Under the Original Consent:
- Condition 2 provided that: *"the Development shall be about¹ 900 MW capacity and comprise:*
 - (a) *one or more gas turbines;*
 - (b) *one or more steam turbines;*
 - (c) *one or more heat recovery steam generators;*
 - (d) *air cooled condensers and auxiliary cooling;*
 - (e) *gas receiving facility;*
 - (f) *one or more electrical switchyards;*
 - (g) *ancillary plant and equipment; and,*
 - (h) *the necessary buildings (including administration offices) and civil engineering works";* and,
 - Condition 4(2) provided that: *"the commencement of the Development shall not be later than five years from the date of this consent, or such longer period as the Secretary of State may hereafter direct in writing"².*
- 1.2.7 Subsequently, in August 2014, GECL submitted an application to vary the Original Consent under Section 36C of the Electricity Act 1989 to:
- Increase the permitted generating capacity from about³ 900 MW to up to 1250 MW.
- The application also sought a direction to vary the conditions subject to which the 2011 Deemed Planning Permission was deemed to be granted under Section 90(2ZA) of the Town and Country Planning Act 1990.
- Together, the 2014 Variation Application.
- 1.2.8 The rationale for the 2014 Variation Application was to enable the use of the latest⁴ gas turbine technologies, including the Alstom GT26 (Amended), GE Flex 50, MHI 701 F5 and the Siemens SGT5-8000H machines.
- 1.2.9 In terms of environmental documentation / studies, the 2014 Variation Application was accompanied by:
- The August 2014 Environmental Statement Further Information Document (August 2014 ES FID), comprising:
 - A Non-Technical Summary; and,
 - Volume 1: Main Text.

¹ A tolerance of up to 5% is permitted.

² Similarly, Condition 3 (Time Limits) of the 2011 Deemed Planning Permission provided that: *"the commencement of the Development shall take place before the expiry of five years from the date of this permission"*.

³ A tolerance of up to 5% is permitted.

⁴ Used within the context of the date and timing of the 2014 Variation Application.

- An Updated CCR Feasibility Study, and an accompanying report by Imperial College London.
- 1.2.10 On 18 November 2014, the Original Consent was varied and a direction that the conditions, subject to which the 2011 Deemed Planning Permission be deemed to be granted, be varied under Section 90(2ZA) of the Town and Country Planning Act 1990 was made (the 2014 Varied Consent and the 2014 Deemed Planning Permission).
- 1.2.11 Under the 2014 Varied Consent:
- Condition 2 was varied to provide that: *"the Development shall be up to 1250 MW capacity ... "*; and,
 - Condition 4(2) was varied to provide that: *" the commencement of the Development shall not be later than five years from 4 August 2011"*⁵.
- 1.2.12 Subsequently, in February 2016, GECL submitted an application to vary the 2014 Varied Consent under Section 36C of the Electricity Act 1989 to:
- Allow for two technology options up to 1250 MW, comprising:
 - (i) Up to two CCGT units (including for each CCGT unit: a gas turbine; a Heat Recovery Steam Generator (HRSG); steam turbine plant; and, associated equipment); or
 - (ii) (1) One CCGT unit (including: a gas turbine; a HRSG; steam turbine plant; and, associated equipment); and,
(2) One or more Open Cycle Gas Turbine (OCGT) units with the OCGT units having a combined total rated electrical output of less than 300 MW (including for each OCGT unit: a gas turbine; and, associated equipment).
 - Extend the commencement deadline (for a further five years).
- The application also sought a direction to vary the conditions subject to which the 2011 Deemed Planning Permission was deemed to be granted under Section 90(2ZA) of the Town and Country Planning Act 1990.
- Together, the 2016 Variation Application.
- 1.2.13 The rationale for the 2016 Variation Application was to:
- Enable the potential use of both highly efficient technology (the CCGT unit) and fast-starting peaking technology (the OCGT unit(s)) at the same site, and provide the flexibility for the development of the most appropriate technology option at the GEC site for the electricity market; and,
 - Allow a meaningful opportunity for GECL to win an award during the Capacity Market Auction⁶, and subsequently progress towards the finalisation of construction contracts, secure a power purchase agreement / tolling contract, and raise project finance.
- 1.2.14 In terms of environmental documentation / studies, the 2016 Variation Application was accompanied by:
- The February 2016 Environmental Statement Further Information Document (February 2016 ES FID), comprising:
 - A Non-Technical Summary; and,
 - Volume 1: Main Text, with Appendices.

⁵ Similarly, Condition 3 (Time Limits) of the 2014 Deemed Planning Permission provided that: *" the commencement of the Development shall take place before the expiry of five years from 4 August 2011"*.

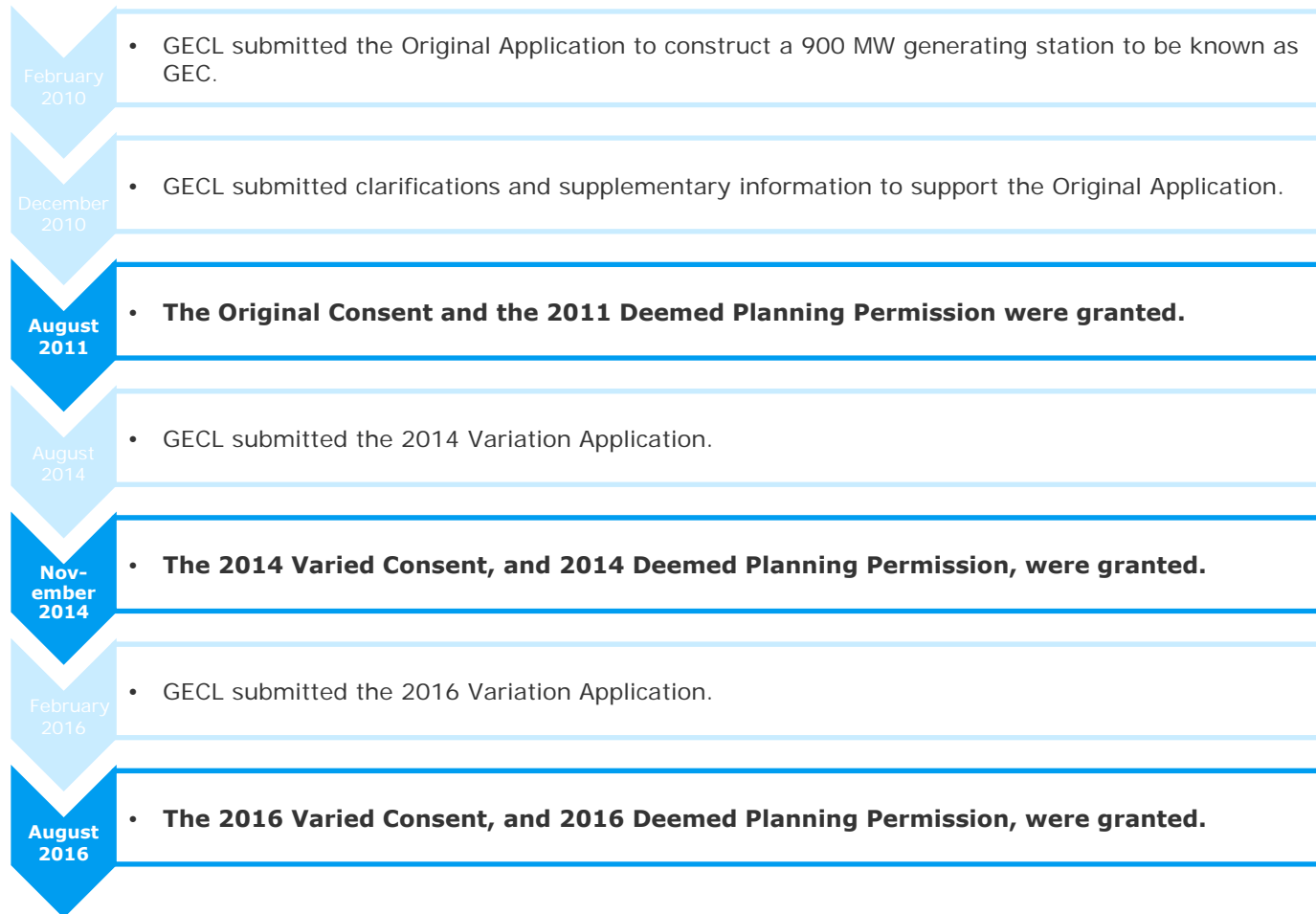
⁶ Used within the context of the date and timing of the 2016 Variation Application, which noted that the decision to run a Capacity Market Auction is made around June by the Secretary of State (i.e. out of GECL's control) and that during the Capacity Market Auction, the clearing price is driven by a number of factors but mainly by the amount of capacity to be procured and the capacity of generating stations that participate (i.e. also out of GECL's control).

- 1.2.15 On 3 August 2016, the 2014 Varied Consent was varied and a direction that the conditions, subject to which the 2014 Deemed Planning Permission be deemed to be granted, be varied under Section 90(2ZA) of the Town and Country Planning Act 1990 was made (the 2016 Varied Consent and the 2016 Deemed Planning Permission).
- 1.2.16 Under the 2016 Varied Consent:
- Condition 2 was varied to provide that: *"the Development shall be up to 1250 MW capacity and comprise:*
 - (a) *Either:*
 - (i) *up to two Combined Cycle Gas Turbine (CCGT) units (including for each CCGT unit: a gas turbine; a heat recovery steam generator; steam turbine plant; and, associated equipment); or,*
 - (ii) *(1) one CCGT unit (including: a gas turbine; a heat recovery steam generator; steam turbine plant; and, associated equipment), and*
(2) one or more Open Cycle Gas Turbine (OCGT) units with the OCGT units having a combined rated electrical output of less than 300 MW⁷ (including for each OCGT unit: a gas turbine; and, associated equipment).
 - (d) *air cooled condensers and auxiliary cooling;*
 - (e) *gas receiving facility;*
 - (f) *one or more electrical switchyards;*
 - (g) *ancillary plant and equipment; and,*
 - (h) *the necessary buildings (including administration offices) and civil engineering works";*
 - Condition 4(1A) was added to provide that: *"the Company shall notify the Secretary of State and Thurrock Council (as the relevant planning authority) which one of the gas turbine technology options in paragraph 2(a) of this consent has been selected prior to the commencement of the Development and provide details of the capacity of each gas turbine technology to be used";* and,
 - Condition 4(2) was varied to provide that: *"the commencement of the Development shall not be later than five years from 3 August 2016"⁸.*
- 1.2.17 Electronic versions of all applications, including historic applications and associated documents, can be downloaded free of charge from the GEC website:
<http://www.intergen.com/development-opportunities-portfolio/gateway-energy-centre-downloads>
- 1.2.18 Insert 1.1 provides a chronological summary of the above information.

⁷ 300 MW refers to the OCGT(s) and not the CCGT and the OCGT(s).

⁸ Similarly, Condition 3 (Time Limits) of the 2016 Deemed Planning Permission provides that: *"the commencement of the Development shall take place before the expiry of five years from 3 August 2016"*.

INSERT 1.1: CONSENTING HISTORY



1.3 The 2019 Variation Application

1.3.1 Based on a number of influencing factors, including electricity market changes and technological advancements, GECL is submitting an application under Section 36C of the Electricity Act 1989, to the Secretary of State via BEIS, to vary the 2016 Varied Consent to:

- Provide that GEC shall remain up to 1250 MW, but shall comprise either (*green italic text added to highlight proposed variation*):
 - (i) *Development Option (i)*, comprising:

Up to two CCGT units (including for each CCGT unit: a gas turbine; a HRSG; steam turbine plant; and, associated equipment); or,
 - (ii) *Development Option (ii)*, comprising:
 - (1) One CCGT unit with a rated electrical output of up to 630 MW (including: a gas turbine, a HRSG; steam turbine plant; and, associated equipment);
 - (2) One or more OCGT units, with the OCGT units having a combined rated electrical output of less than 300 MW (including for each OCGT unit: a gas turbine; and, associated equipment); and,
 - (3) *A Battery Energy Storage System (BESS) with a rated electrical output of up to 320 MW (including: batteries; associated enclosures; control and protection systems; temperature control systems; and, power conversion systems).*
- Provide that the commencement of GEC shall take place not later than 31 December 2023.
- Better allow for a phased development of GEC by varying conditions and including a new condition to specify and require, where relevant, that:
 - Certain conditions only apply to a specific phase of the Proposed Development, and not to other phases;
 - A scheme for the phasing of the works comprised in the Proposed Development be submitted and approved; and,
 - Under certain conditions, the approval of details may be applied for and granted on a phase-by-phase basis.
- With regards to CCR and designated sites, provide that:
 - 'CCS site for Development Option (i)' and 'CCS site for Development Option (ii)' mean the areas of land hatched green on FIGURE 1620002349-018-00004 (P02) and FIGURE 1620002349-018-00005 (P02) respectively allocated to the Development Options; and,
 - 'designated site' means, following notification to the Secretary of State and Thurrock Borough Council which one of the Development Options has been selected, the area of land allocated to that Development Option as the area where GECL proposes to locate the capture equipment.

The application also seeks a direction to vary the conditions subject to which the 2016 Deemed Planning Permission was deemed to be granted under Section 90(2ZA) of the Town and Country Planning Act 1990.

Together, the 2019 Variation Application.

1.3.2 Section 2 (Rationale for Development) provides the rationale for the 2019 Variation Application.

*Required Content of a Variation Application
The Electricity Generating Stations (Variation of Consents) (England and Wales)
Regulations 2013*

- 1.3.3 Regulation 3 of the Electricity Generating Stations (Variation of Consents) (England and Wales) Regulations 2013 (the Variation Regulations) (as amended by the Electricity Works (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations)) specifies the required content of a variation application.
- 1.3.4 Table 1.1 sets out the required content of a variation application, along with a description of GECL's compliance.

TABLE 1.1: REQUIRED CONTENT OF AN APPLICATION UNDER SECTION 36C OF THE ELECTRICITY ACT 1989 / DESCRIPTION OF GECL'S COMPLIANCE

Regulation 3		GECL's Compliance
(1)	A variation application must –	
(a)	be made in writing;	GECL is submitting the 2019 Variation Application. Two hard copies and two USBs containing the 2019 Variation Application have been submitted.
(b)	describe the location of the Proposed Development by reference to a map;	The location of the Proposed Development is 'The Manorway, Stanford-le-Hope, Essex', shown as the area of land edged red on 'FIGURE 63114-PBP-0025'. The 2019 Variation Application is accompanied by 'FIGURE 63114-PBP-0025'.
(c)	state –	
	(i) why it is proposed that the relevant section 36 consent should be varied;	Section 2 (Rationale for Development) provides the rationale for the 2019 Variation Application.
	(iii) what account has been taken of views expressed by persons who have been consulted by the applicant about the proposed variation;	Section 5 (Stakeholder Consultations) provides a summary of the pre-application consultation and responses in relation to the 2019 Variation Application. Wherever relevant, this Section also provides a summary of the subsequent actions taken, and references to additional information.
(d)	include –	
	(i) a draft of the variations which the applicant proposes should be made to the relevant section 36 consent; and	The 2019 Variation Application is accompanied by a draft of the proposed variations.
	(iii) copies of any maps or plans not referred to in the relevant section 36 consent but which the applicant proposes that the relevant section 36 consent should refer to after it is varied; and	With regards to CCR, the 2019 Variation Application seeks to include a 'CCS site for Development Option (i)' and a 'CCS site for Development Option (ii)'. These are shown in Figure 1620002349-018-00004 and Figure 1620002349-018-00005 respectively. The 2019 Variation Application is accompanied by Figure 1620002349-018-00004 and Figure 1620002349-018-00005.
(e)	if the application relates to an offshore generating station, identify which of the bodies referred to in paragraph (b) of the definition of "relevant planning authority" in regulation 2(1) are, in the applicant's opinion, likely to have an interest in the variation application.	Not relevant. GEC is not an offshore generating station.
(2)	A variation application must include particulars of –	
(a)	the relevant section 36 consent, and, if that consent was not granted to the applicant, how the applicant has the benefit of that consent;	The 2019 Variation Application is accompanied by a copy of the 2016 Varied Consent and the 2016 Deemed Planning Permission. GECL has the benefit of the 2016 Varied Consent and the 2016 Deemed Planning Permission.
(b)	where the appropriate authority is the Secretary of State, any section 90 direction given on granting the relevant section 36 consent;	The 2019 Variation Application is accompanied by a copy of the 2016 Varied Consent and the 2016 Deemed Planning Permission. GECL has the benefit of the 2016 Varied Consent and the 2016 Deemed Planning Permission.

Regulation 3	GECL's Compliance
(c) any permit, licence, consent or other authorisation (other than the relevant section 36 consent) given in connection with the construction or operation of the Proposed Development (a "relevant authorisation"), including any variation or replacement of a relevant authorisation; and,	The 2019 Variation Application is accompanied by: <ul style="list-style-type: none"> • A planning permission (Reference: 11/50286/TTGFUL) dated 8 March 2011 for an underground gas pipeline and associated Above Ground Installation (AGI) (this planning permission has been implemented); • A planning permission (Reference: 12/01085/FUL) dated 27 February 2013 for the HV underground electrical connection and associated extension to the Coryton Substation (however, this development was not commenced, and the planning permission has since expired); and, • An Environmental Permit (Reference: EPR/EP3536EN) (under the Environmental Permitting (England and Wales) Regulations 2010.
(d) any application that has been made for a relevant authorisation or variation of a relevant authorisation.	Not relevant. At the time of writing, no such applications have been made. However, GECL intends to seek additional authorisations for gas and electrical connections. Further information is provided in Section 1.5 (Associated Authorisations Granted and to be Sought).
(3) Where the appropriate authority is the Secretary of State and the applicant requests the Secretary of State to make a section 90 direction on varying the relevant section 36 consent, the application must –	
(a) identify the section 90 development in respect of which that request is made and describe its location by reference to a map;	The 2019 Variation Application is accompanied by a copy of the 2016 Varied Consent and the 2016 Deemed Planning Permission. The location of the Proposed Development is 'The Manorway, Stanford-le-Hope, Essex', shown as the area of land edged red on 'FIGURE 63114-PBP-0025'. The 2019 Variation Application is also accompanied by 'FIGURE 63114-PBP-0025'.
(b) state –	
(i) why it is proposed that the direction should be made; and	Section 2 (Rationale for Development) provides the rationale for the 2019 Variation Application.
(ii) what account has been taken of views expressed by persons who have been consulted by the applicant about the proposed direction; and	Section 5 (Stakeholder Consultations) provides a summary of the pre-application consultation and responses in relation to the 2019 Variation Application. Wherever relevant, this Section also provides a summary of the subsequent actions taken, and references to additional information.
(c) include –	
(i) a draft of the proposed direction; and	The 2019 Variation Application is accompanied by a draft of the proposed direction in the form of variations to the 2016 Deemed Planning Permission.
(ii) copies of any maps or plans to which it is proposed that the section 90 direction should refer which are not – (aa) referred to in the relevant section 36 consent or any section 90 direction given on granting the relevant section 36 consent; or (bb) included in the application in accordance with paragraph (1)(d)(ii).	Not relevant. GECL is not proposing to replace any other maps or plans to those included in the 2019 Variation Application in accordance with paragraph (1)(d)(ii).
(4)	Provision revoked by paragraph 6(2) of Schedule 5 of the EIA Regulations.

1.4 The Purpose of this Document

- 1.4.1 To accompany the 2019 Variation Application, GECL is providing the following information to BEIS:
- The 2019 ES FID; and,
 - The 2019 Updated CCR Feasibility Study.
- 1.4.2 This document is the 2019 ES FID.
- 1.4.3 This 2019 ES FID in combination with the February 2010 ES, December 2010 ES FID, August 2014 ES FID and the February 2016 ES FID comprise the EIA Report and further environmental information for the Proposed Development (being the generating station GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as requested in the 2019 Variation Application).
- 1.4.4 This 2019 ES FID in combination with the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID provide:
- A description of the reasonable alternatives studied by GECL that are relevant to the Proposed Development (being the generating station which GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as per the 2019 Variation Application) and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment;
 - A description of the parameters of the Proposed Development;
 - A description of the relevant aspects of the current state of the environment (baseline scenario);
 - A description of the likely significant effects of the Proposed Development on the environment;
 - In the case of this 2019 ES FID, the August 2014 ES FID and the February 2016 ES FID, a description of the main respects in which the likely significant effects of the Proposed Development will differ from those previously described; and,
 - A description of the features of the Proposed Development, and any measures envisaged, in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.

1.5 Associated Authorisations Granted and to be Sought

- 1.5.1 During operation:
- Both Development Option (i) and Development Option (ii) include the construction of a CCGT unit(s). Development Option (ii) additionally includes the construction of an OCGT unit(s). The CCGT unit(s) or the CCGT unit and OCGT unit(s) will burn natural gas only, which will be required to be supplied to the GEC site via an underground gas pipeline (i.e. via a gas connection);
 - The electricity generated will be dispatched to the National Grid Electricity National Transmission System via a new HV electrical connection from the GEC site into the existing National Grid Coryton South Substation (i.e. via an electrical connection); and,
 - Activities on the GEC site will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016.
- 1.5.2 For these, this Section provides a summary of the associated authorisations granted and to be sought for the gas and electrical connections required for the development of GEC and for the operational activities on the GEC site.

Gas Connection

- 1.5.3 In March 2011, GECL submitted an application for planning permission under the Town and Country Planning Act 1990 to Thurrock Thames Gateway Development Corporation

(TTGDC) to construct an underground gas pipeline and associated Above Ground Installation (AGI) required for the development of GEC.

- 1.5.4 On 8 March 2012, planning permission (Reference: 11/50286/TTGFUL) was granted to GECL by TTGDC to: *"develop an underground gas pipeline, an above ground installation (AGI) and ancillary development (including pipeline route markers, cathodic protection posts, M4 marker posts (for special crossings) and landscaping / biodiversity provision)".*
- 1.5.5 Following discharge of the relevant conditions, this planning permission was implemented on 7 March 2017 by the construction of a new access road to the associated AGI. The implementation was in accordance with approved drawings and documents, thereby the planning permission is preserved in perpetuity.
- 1.5.6 Under both Development Options, this approximately 8 km long underground gas pipeline is required for the CCGT unit(s) as there is not sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station.
- 1.5.7 However, under Development Option (ii), should there be phasing of GEC with the OCGT unit(s) constructed and operated in advance of the CCGT unit, there is sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station for the OCGT unit(s). As it is technical feasible to 'tap-in' to the existing underground gas pipeline, under Development Option (ii), a phase with only OCGT unit(s) would be more cost-competitive in comparison to a phase which also includes the CCGT unit, as the OCGT unit(s) would not be financially overburdened by the cost of the 8 km long underground gas pipeline for the CCGT unit. This would allow the OCGT unit(s) to participate as a separate Capacity Market Unit within the Capacity Market Auction, thereby maximising the potential to successfully secure a Capacity Market Award.
- 1.5.8 Therefore, GECL are currently investigating the potential for a shorter length of underground gas pipeline based on a 'tap-in' to the existing underground gas pipeline serving the existing Coryton CCGT generating station. As part of this 'tap-in', a smaller AGI would also be required. In progressing this investigation, GECL has commissioned some initial gas feasibility work to identify possible new route options and AGI locations. It is currently anticipated that the initial gas feasibility work will be further developed into an application for the shorter length of underground gas pipeline and smaller AGI, most likely an application for planning permission under the Town and Country Planning Act 1990.

Electrical Connection

- 1.5.9 In November 2012, GECL submitted an application for planning permission under the Town and Country Planning Act 1990 to Thurrock Borough Council to construct a HV underground electrical connection and associated extension of the existing National Grid Coryton South Substation required for the development of GEC.
- 1.5.10 On 27 February 2013, planning permission (Reference: 12/01085/FUL) was granted to GECL by Thurrock Borough Council: *"for the development of a high voltage electrical connection comprising an underground and possible part culverted double circuit 400 kV cable system linking the approved Gateway Energy Centre electrical switchyard/s to the existing National Grid Coryton South Substation, together with an extension to the substation, installation of electrical equipment (including a 400 kV rotating centre post disconnector, 400 kV surge arrestors, 400 kV air insulated switchgears / gas insulated switchgear buildings, 400 kV gas insulated switchgear circuit breaker, 400 kV gas insulated switchgear cable sealing ends), associated development (including transitional bay, marker posts / plates) and access track works".*
- 1.5.11 However, this development was not commenced, and the planning permission has since expired. Accordingly, GECL has commissioned some initial electrical feasibility work to identify possible new route options for the HV electrical connection and it is currently anticipated that the initial electricity feasibility work will be developed into an application for the new HV electrical connection, most likely an application for a replacement planning permission under the Town and Country Planning Act 1990.

Operational Activities on the GEC Site / Environmental Permit

- 1.5.12 During operation, activities on the GEC site will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016. GECL already holds an Environmental Permit for the development permitted by the 2014 Varied Consent (EPR/EP3536EN) issued in July 2016. Based on the Development Option selected, an application to vary this Environmental Permit will be made in due course.

2. RATIONALE FOR DEVELOPMENT

2.1 Summary of the Rationale for the Development of GEC

From the Original Consent / 2011 Deemed Planning Permission

- 2.1.1 On 4 August 2011, the Original Consent was granted and a direction that the 2011 Deemed Planning Permission be granted was made.
- 2.1.2 The letter accompanying the Original Consent and the 2011 Deemed Planning Permission stated (at paragraph 6.1) the Secretary of State's view that: *"Gas-fired power stations play a vital role in providing reliable electricity supplies; they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix. They will continue to play an important role in the energy mix as the UK makes the transition to a low carbon economy, and they must be constructed in line with climate change goals"*.
- 2.1.3 In addition, the letter stated that, in making the subsequent decision, a number of material issues were considered. These issues included (at paragraph 8.1(vi)): *"That there is a continuing need for new electricity generating infrastructure given that some 22 GW of existing electricity generating capacity is scheduled to close by 2020"*.
- 2.1.4 The Secretary of State's view and subsequent decision confirmed that fossil-fuelled generating stations would play a key role in providing reliable and flexible capacity to provide back-up and maintain the safety margin⁹ and also confirmed that the development of GEC was an appropriate candidate to contribute to the need for new energy infrastructure.
- 2.1.5 Therefore, the Secretary of State's view and subsequent decision confirmed the rationale for the development of GEC.

From the 2014 Variation Application / 2016 Variation Application

- 2.1.6 Following the submission of the Original Application, national policy for energy infrastructure (including the construction / extension of a generating station with a generating capacity of more than 50 MW) was set out in the 'Overarching National Policy Statement (NPS) for Energy (EN-1)'¹⁰ (NPS EN-1), and the technology-specific NPSs. In July 2011, these were approved in Parliament. Used together, and in accordance with the provisions of Section 104 of the Planning Act 2008, the NPSs form the primary policy basis for decisions made by the Secretary of State on applications for energy infrastructure comprising Nationally Significant Infrastructure Projects (NSIPs) under the Planning Act 2008.
- 2.1.7 In terms of the applicability of the NPSs to applications under different consenting regimes, in a letter dated 9 November 2009 from the Department of Communities and Local Government¹¹ it is stated (at paragraph 17) that: *"NPSs may specifically set out policies which will need to be taken into account by decisions makers other than the [Planning Inspectorate]. [...] [Local Planning Authorities] and other decision-makers should therefore take account of those policies when determining applications for consent"*.
- 2.1.8 As such, the 2014 Variation Application and the 2016 Variation Application considered that the NPSs form a material consideration, and thus supplementary rationale for the development of GEC was provided in:

⁹ The safety margin is an amount of spare capacity which is able to accommodate unexpectedly high demand and mitigate risks (such as unexpected power plant closures or extreme weather events). The larger the difference between available electricity generating capacity and electricity demand (i.e. the larger the safety margin), the more resilient the system will be.

¹⁰ Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf

¹¹ Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7989/091109-Letter_to_Chief_Planning_Officers- National_Policy_Statements.pdf

- NPS EN-1 (in particular Part 3 (The Need for New Nationally Significant Energy Infrastructure Projects)); and,
- The technology-specific 'National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)'¹².

The Overarching Need for New Energy Infrastructure

- 2.1.9 NPS EN-1 states (at paragraph 2.1.2) that: *"Energy is vital to economic prosperity and social well-being and so it is important to ensure that the UK has secure and affordable energy. Producing the energy the UK requires and getting it to where it is needed necessitates a significant amount of infrastructure, both large and small scale"*.
- 2.1.10 Therefore, in terms of the overarching need for new energy infrastructure, NPS EN-1 states that:
- (at paragraph 3.1.1): *"The UK needs all the types of energy infrastructure covered by this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions"*;
 - (at paragraph 3.1.2): *"It is for industry to propose new energy infrastructure projects within the strategic framework set by Government. The Government does not consider it appropriate for planning policy to set targets for or limits on different technologies"*;
 - (at paragraph 3.1.3): *"The [relevant authority] should therefore assess all applications for [...] consent for the types of infrastructure covered by the energy NPSs on the basis that the Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need is as described for each of them in this Part"*; and,
 - (at paragraph 3.1.4): *"The [relevant authority] should give substantial weight to the contribution which projects would make towards satisfying this need when considering applications for [...] consent"*.

The Need for New Fossil-Fuel Electricity Generating Stations

- 2.1.11 In terms of fossil-fuelled electricity generating stations, NPS EN-1 states (at paragraph 3.6.1) that: *"Fossil fuel [generating] stations play a vital role in providing reliable electricity supplies: they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix. They will continue to play an important role in our energy mix as the UK makes the transition to a low carbon economy, and Government policy is that they must be constructed, and operate, in line with increasingly demanding climate change goals"*.
- 2.1.12 Furthermore, NPS EN-1 states (at paragraph 3.6.8) that: *"A number of fossil fuel generating stations will have to close by the end of 2015. Although this capacity may be replaced by new nuclear and renewable generating capacity in due course, it is clear that there must be some fossil fuel generating capacity to provide back-up for when generating from intermittent renewable generating capacity is low and to help with the transition to low carbon electricity generation"*.

From the Varied Consents / Deemed Planning Permissions

The 2014 Varied Consent (and 2014 Deemed Planning Permission)

- 2.1.13 The 2014 Variation Application sought to:
- Increase the permitted generating capacity from about¹³ 900 MW to up to 1250 MW.
- 2.1.14 On 18 November 2014, the 2014 Varied Consent was granted and a direction that the 2014 Deemed Planning Permission be granted was made. Therefore, the Secretary of

¹² Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47855/1939-nps-for-fossil-fuel-en2.pdf

¹³ A tolerance of up to 5% is permitted.

State accepted GECL's rationale for varying the Original Consent (and the 2011 Deemed Planning Permission).

[The 2016 Varied Consent \(and 2016 Deemed Planning Permission\)](#)

2.1.15 The 2016 Variation Application sought to:

- Allow for two technology options up to 1250 MW, comprising:
 - (i) Up to two CCGT units (including for each CCGT unit: a gas turbine; a HRSG; steam turbine plant; and, associated equipment); or,
 - (ii) (1) One CCGT unit (including: a gas turbine, HRSG; steam turbine plant; and, associated equipment); and,
 - (2) One or more OCGT units with the OCGT units having a combined rated electrical output of less than 300 MW (including for each OCGT unit: a gas turbine; and, associated equipment).
- Extend the commencement deadline (for a further 5 years).

2.1.16 On 3 August 2016, the 2016 Varied Consent was granted and a direction that the 2016 Deemed Planning Permission be granted was made. Therefore, the Secretary of State accepted GECL's rationale for varying the 2014 Varied Consent (and the 2014 Deemed Planning Permission).

2.1.17 With regards allowing the two technology options, the letter accompanying the 2016 Varied Consent and the 2016 Deemed Planning Permission stated (at paragraph 8.2) that:

- *"The Secretary of State is satisfied that giving flexibility in gas turbine technology helps to fulfil the need for nationally significant gas infrastructure set out in Overarching National Policy Statement for Energy EN-1"*;
- *"The Secretary of State is satisfied that including these options in relation to gas turbine technologies is an appropriate variation"*;
- *"Whichever technology option is taken forward, the Secretary of State considers that the varied Development will not differ significantly from the generating station to which the Original Consent referred"*; and,
- *"The Secretary of State considers that any difference in construction, extension, operation or likely environmental effects would not be such as to require authorisation by a new consent"*.

2.1.18 With regards to the extension of the commencement deadline, the letter accompanying the 2016 Varied Consent and the 2016 Deemed Planning Permission stated (at paragraph 7.2) that:

- *"The Secretary of State has considered the reasons put forward by the Company and, in the circumstances of this variation application, considers that a five year extension is required in order to give the Development a reasonable prospect of commencement within the consent period"*.

Summary

2.1.19 The rationale for the development of GEC has been provided and confirmed through the grant of the Original Consent (with the 2011 Deemed Planning Permission), and the subsequent grant of the 2014 Varied Consent (with the 2014 Deemed Planning Permission) and the 2016 Varied Consent (with the 2016 Deemed Planning Permission).

2.2 Rationale for the 2019 Variation Application

2.2.1 Based on a number of influencing factors, GECL is submitting the 2019 Variation Application. The 2019 Variation Application seeks to:

- Provide that GEC shall remain up to 1250 MW, but shall comprise either (*green italic text added to highlight proposed variation*):
 - (i) *Development Option (i)*, comprising:

Up to two CCGT units (including for each CCGT unit: a gas turbine; a HRSG; steam turbine plant; and, associated equipment); or,

(ii) *Development Option (ii)*, comprising:

(1) One CCGT unit with a rated electrical output of up to 630 MW (including: a gas turbine, HRSG; steam turbine plant; and, associated equipment);

(2) One or more OCGT units, with the OCGT units having a combined rated electrical output of less than 300 MW (including for each OCGT unit: a gas turbine; and, associated equipment); and,

(3) A Battery Energy Storage System (BESS) with a rated electrical output of up to 320 MW (including: batteries; associated enclosures; control and protection systems; temperature control systems; and, power conversion systems).

- Provide that the commencement of GEC shall take place not later than 31 December 2023.
- Better allow for a phased development of GEC by varying conditions and including a new condition to specify and require, where relevant, that:
 - Certain conditions only apply to a specific phase of the Proposed Development, and not to other phases;
 - A scheme for the phasing of the works comprised in the Proposed Development be submitted and approved; and,
 - Under certain conditions, the approval of details may be applied for and granted on a phase-by-phase basis.
- With regards to CCR and designated sites, provide that:
 - 'CCS site for Development Option (i)' and 'CCS site for Development Option (ii)' mean the areas of land hatched green on FIGURE 1620002349-018-00004 (P02) and FIGURE 1620002349-018-00005 (P02) respectively allocated to the Development Options; and,
 - 'designated site' means, following notification to the Secretary of State and Thurrock Borough Council which one of the Development Options has been selected, the area of land allocated to that Development Option as the area where GECL proposes to locate the capture equipment.

2.2.2 The NPSs, which formed part of the rationale for the 2014 Variation Application and the 2016 Variation Application, remain part of the rationale for the 2019 Variation Application.

Rationale for Varying the Technology Options for GEC

2.2.3 The 2019 Variation Application seeks to:

- Provide that GEC shall remain up to 1250 MW, but shall include in Development Option (ii) a BESS with a rated electrical output of up to 320 MW (alongside the CCGT unit and the OCGT unit(s)).

2.2.4 BESS technologies offer great potential to support the UK's electricity transmission and distribution network system, and have been named by the UK Government as one of the "*eight great technologies ... in which the UK is set to be a global leader*"¹⁴.

2.2.5 In addition, the UK Government notes that UK researchers are developing next generation batteries which could "*reduce our electricity consumption by one fifth*", and with the increased integration of intermittent renewable energy technologies (such as solar photovoltaics (PV) and wind) "*will keep the lights on*". The UK Government also notes

¹⁴ Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249255/eight_great_technologies_overall_info_graphic.pdf

that *"innovation in energy storage could create £12bn of new business revenue in the UK"*¹⁵.

2.2.6 Furthermore, the Renewable Energy Association states that the use of energy storage technologies is *"a key missing piece for the UK's energy policy"* and can *"help deliver the low carbon energy the country needs"*¹⁶.

2.2.7 The Renewable Energy Association also notes a number of key benefits which energy storage technologies can offer. When compared to the UK's 'Energy Trilemma'¹⁷, these key benefits include:

- In terms of ensuring security of supply:
 - Helping to optimise overall supply and demand, and thereby reducing the reliance on supplies through interconnectors;
 - Reducing transmission and distribution losses¹⁸;
 - Addressing the increasing requirements for flexibility; and,
 - Providing network system stability.
- In terms of decarbonising:
 - Supporting the integration of zero-carbon renewable energy technologies (such as solar PV and wind); and,
 - Reducing the use of fossil fuels (and hence reducing emissions), creating a greener mix.
- In terms of containing costs:
 - Reducing businesses and consumer bills as energy can be stored when prices are low, and discharged when prices are high; and,
 - Reducing the amount of transmission and distribution network upgrades required.

2.2.8 Furthermore, the UK Government and OFGEM state that *"storage can open up many possibilities, helping to integrate low carbon generation, reduce the costs of operating the system, and help avoid or defer costly reinforcements to the network"*¹⁹.

Summary

2.2.9 Under Development Option (ii), a BESS will complement the proposed CCGT unit and OCGT unit(s) at the GEC site and will be able to provide essential support to the electricity system by storing and discharging energy, delivering significant benefits in meeting the UK's 'Energy Trilemma'.

2.2.10 In particular, in decarbonising and supporting the UK's commitment to net zero-carbon emissions by 2050, the BESS will support the further integration of zero-carbon renewable energy technologies (such as solar PV and wind). The BESS will enable energy produced from renewable technologies during times of low demand and / or during favourable generation conditions to be stored and subsequently discharged during times of peak demand. The use of an energy storage system for this is essential because favourable generation conditions for renewable sources frequently do not coincide with periods of peak demand. Using solar PV as an example, the BESS will enable energy produced during the day to be stored and 'time-shifted', such that energy can be available during the period of peak evening demand.

¹⁵ Available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249262/energy_storage_infographic.pdf

¹⁶ 'Energy Storage in the UK: An Overview', Renewable Energy Association (Winter 2015 / 2016).

¹⁷ The UK's 'Energy Trilemma' is widely accepted to represent the key challenges of: ensuring security of supply; decarbonising; and, containing costs.

¹⁸ The Renewable Energy Association note that *"transmission losses typically run at just below 10% of the total energy produced in the UK"*.

¹⁹ 'Upgrading Our Energy System: Smart Systems and Flexibility Plan', HM Government and OFGEM (July 2017).

- 2.2.11 To highlight the scale and ambition of the 2019 Variation Application, a 320 MW BESS with a 4-hour discharge capability (1.3 GWh) would be one of the largest in the world at the current time. In a UK context, recent statistics indicate that the UK currently has 3300 MW of operational storage capacity (including hydro projects)²⁰, with 450 MW being operational large-scale (>1 MW) battery storage²¹. Within this context, a BESS with a rated electrical output of up to 320 MW represents approximately 10% of total operational storage capacity and just over approximately 70% of operational large-scale battery storage capacity, and would be enough capacity to fully charge 32000 electric vehicles²².
- 2.2.12 Furthermore, whilst the average size of applications for large-scale battery storage continues to rise (from a 2016 average of 10 MW to a 2018 average of 27 MW), the scale of the 2019 Variation Application is such that it is over 10-times the average for such projects.

Rationale for Commencement Deadline Extension and Phased Development

- 2.2.13 The 2019 Variation Application seeks to:
- Provide that the commencement of GEC shall take place not later than 31 December 2023.
 - Better allow for a phased development of GEC by varying conditions and including a new condition to specify and require, where relevant, that:
 - Certain conditions only apply to a specific phase of the Proposed Development, and not to other phases;
 - A scheme for the phasing of the works comprised in the Proposed Development be submitted and approved; and,
 - Under certain conditions, the approval of details may be applied for and granted on a phase-by-phase basis.
- 2.2.14 Recognising that the technology, design and (in particular) financing of generating stations can take a great deal of time to finalise, and that it is also necessary to put in place infrastructure and agreements for the import of fuel and the export of electricity, developers of generating stations have a variety of factors to address. These factors include (but are by no means limited to): changing technologies and designs; and, uncertain markets for both fuel and electricity.
- 2.2.15 Indeed, the Variation Guidance²³ issued by the Department of Energy and Climate Change (DECC, now BEIS) states (at paragraph 12) that: *“generating station [...] consents are often not implemented until some years after they are granted. Each consent reflects technology and industry practice at the time it was applied for, but such practices do not stand still, even in relatively mature sectors. This means that when a developer comes to construct a generating station, it will sometimes be uneconomic or have more detrimental effects on the environment to do so according to all the details specified in the consent. In practice, this means changes to the original proposals to make the project feasible”.*
- 2.2.16 As a result, a generating station cannot sensibly be compared to other simpler projects where shorter commencement deadlines, with no phasing of works, can often be an effective incentive to bring forward much needed development. Indeed, a generating station represents a complex project where longer commencement deadlines, with phasing of works, can be justified.

²⁰ Renewable Energy Association. Available at: <https://www.renewableuk.com/news/425522/Energy-storage-capacity-set-to-soar-300-UK-based-companies-involved-in-new-sector.htm>

²¹ Solar Power Portal. Available at: <https://www.solarpowerportal.co.uk/blogs/a-leap-forward-for-large-scale-storage-uks-new-capacity-to-top-500mw-in-201>

²² Based on Renewable Energy Association figures. Available at: <https://www.renewableuk.com/news/425522/Energy-storage-capacity-set-to-soar-300-UK-based-companies-involved-in-new-sector.htm>

²³ ‘Varying Consents granted under Section 36 of the Electricity Act 1989 for Generating Stations in England and Wales: A Guidance Note on the New Process’, Department of Energy and Climate Change (July 2013).

- 2.2.17 Furthermore, whilst the rationale for the commencement deadline extension and phased development are not limited to issues relating to the UK Government's Capacity Market, these have undoubtedly added to the variety of factors to be addressed.

[Summary](#)

- 2.2.18 The rationale for the commencement deadline extension and phased development is to maximise the potential for GEC to secure a 15-year contract(s) in future Capacity Market Auctions and, in recognition of their differing economics, be able to participate as separate Capacity Market Units within the Capacity Market Auction, thereby maximising the potential to successfully secure a 15-year Capacity Market Award, and consequently secure financing of the relevant project(s).
- 2.2.19 At the time of writing the Capacity Market is suspended as a result of a recent judgement by the European Union Court of Justice. The European Commission is currently addressing the requirements of the judgement, which include whether the Capacity Market is compatible with State Aid rules. If the European Commission considers that the Capacity Market is compatible with the rules, it is possible with the Capacity Market may be reinstated in Q4 2019. On this basis, the current understanding is that the Capacity Market Auctions (or a similar mechanism) could be held early next year (2020) with both three year ahead (T-3) and four year ahead (T-4) auctions held. Subsequently, annual T-4 auctions would be held.
- 2.2.20 GEC has participated in four Capacity Market Auctions, under Development Option (i) as CCGT Capacity Market Units, and to date has not been successful in securing a Capacity Market Award.
- 2.2.21 Based on the current understanding, the commencement deadline extension would allow five opportunities for participation in the Capacity Market Auction (i.e. the 2020 T-3 (first delivery year 2022 – 2023), the 2020 T-4 (first delivery year 2023 – 2024), the 2021 T-4 (first delivery year 2024 – 2025), the 2022 T-4 (first delivery year 2025 – 2026) and the 2023 T-4 (first delivery year 2026 – 2027)).
- 2.2.22 By means of a comparison with similar developments, InterGen's Spalding Energy Expansion project has participated in three Capacity Market Auctions with both CCGT Capacity Market Unit and OCGT Capacity Market Unit configurations. To date, only the OCGT Capacity Market Unit has been successful in securing a 15-year Capacity Market Award (in the 2016 T-4 (first delivery year 2020 – 2021)).

Rationale for Variations regarding CCR and Designated Sites

- 2.2.23 The rationale for the variations regarding CCR and designated site is to allow GECL, at the time of notification to the Secretary of State and Thurrock Borough Council which one of the Development Options has been selected, to dispose of the CCS site associated with the Development Option not selected.
- 2.2.24 Further information is provided in the Updated CCR Feasibility Study.

3. POLICY CONTEXT

3.1 Introduction

- 3.1.1 This Section has been prepared by DWD.
- 3.1.2 This Section considers the legislative, energy and planning policy context relevant to the 2019 Variation Application.

3.2 Legislative Context

- 3.2.1 Section 20 of the Growth and Infrastructure Act 2013 inserts Section 36C into the Electricity Act 1989 which provides:

- At Section 36C(1): "*The person for the time being entitled to the benefit of a section 36 Consent may make an application to the appropriate authority for the consent to be varied*"; and,
- At Section 36C(4): "*On an application for a Section 36 consent to be varied, the appropriate authority may make such variations to the consent as appear to the authority to be appropriate, having regard (in particular) to:*
 - (a) *the applicant's reasons for seeking the variation;*
 - (b) *the variations proposed;*
 - (c) *any objections made to the proposed variations, the views of the consultees and the outcome of any public inquiry*".

Essentially, Section 36C empowers the Secretary of State, where he considers it appropriate, to vary Consents granted under Section 36 of the Electricity Act 1989.

- 3.2.2 In addition, Section 21 of the Growth and Infrastructure Act 2013 substitutes new sub-sections (2) and (2ZA) for Section 90(2) of the Town and Country Planning Act 1990 enabling the Secretary of State on varying a consent under Section 36 to issue a direction to either vary an existing deemed planning permission or to deem a new planning permission granted.
- 3.2.3 Regulation 3 of the Variation Regulations (as amended by the EIA Regulations) specifies the required consent of Variation Application. The 2014 Variation Application, the 2016 Variation Application and this 2019 Variation Application are compliant with the Variation Regulations.
- 3.2.4 Furthermore the 2014 Variation Application, the 2016 Variation Application and this 2019 Variation Application are consistent with the advice given in the Variation Guidance, in particular the intended purpose and scope of the Section 36 variation procedure as described therein. Indeed, the Variation Guidance explains (at paragraph 25) that it does not attempt to be definitive about the scope of the Section 36 variation procedure because what is appropriate: "*will depend on the provisions of the existing consent, the specific circumstances of the project, and the nature and extent of the proposed changes and their environmental impacts*". However, the overarching principle (as outlined at paragraph 26) is that provided the development would not be fundamentally different, in terms of character or scale and environmental impact to that authorised by the existing consent then it is likely to be suitable for a variation application going on to note that potentially substantial changes, such as "*changes in the plant's main fuel or other power source are unlikely to be considered suitable subject-matter for a variation*", whereas "*some less significant changes to the particular type and or operation of technology used may, however, be suitable for consideration under the variation procedure...*".
- 3.2.5 It is relevant to note that, in January 2018, the Secretary of State concluded in approving the variation to the Section 36 Consent for the Spalding Energy Expansion to allow a

BESS alongside a CCGT unit and OCGT unit(s)²⁴ such a variation was suitable for consideration under the Section 36 variation procedure.

3.3 Energy and Planning Policy Context

3.3.1 This Section provides the energy and planning policy context. *Green italic text has been added to highlight updates to the energy and planning policy context previously described.*

- On 18 July 2011, Parliament approved six National Policy Statements (NPSs) for energy infrastructure; on 19 July 2011, the Secretary of State for Energy and Climate Change designated the NPSs under Section 5 of the Planning Act 2008.
- *On 19 February 2019, the revised National Planning Policy Framework (NPPF) was published by the Ministry of Housing, Communities and Local Government. This replaces the first version of the NPPF (published on 27 March 2012 by the Department for Communities and Local Government (DCLG)) as referred to variously in the August 2014 ES FID and the February 2016 ES FID. The revised NPPF continues to provide guidance for local planning authorities (LPAs) and decision makers, both in respect of drawing up plans and making decisions about planning applications.*
- On 21 December 2011, Thurrock Borough Council (the Council) adopted its 'Core Strategy and Policies for Management of Development'. On 1 August 2013, the Council submitted its 'Core Strategy and Policies for Management of Development Focussed Review – Consistency with National Planning Policy Framework' to the Secretary of State for independent examination. On 28 January 2015, the Council adopted the 'Core Strategy and Policies for Management of Development Focussed Review: Consistency with National Planning Policy Framework Local Plan' (referred to as the Focussed Review).
- On 6 December 2012, the Secretary of State for Communities and Local Government introduced the Regional Strategy (RS) for the East of England (Revocation) Order 2012 which came into force on 3 January 2013. The Order revoked the Regional Strategy for the East of England (2008) and all directions preserving policies contained in structure plans in the corresponding area; the RS is no longer part of the development plan and is therefore not considered further.
- On 4 November 2013, at an extraordinary meeting, the Council considered progress on the DP World® London Gateway Logistics Park, at which it agreed to make a Local Development Order (LDO), to simplify the consenting regime and to speed up the delivery of the DP World® London Gateway Logistics Park. The LDO excludes the GEC site and is therefore not considered further.
- On 6 March 2014, the DCLG launched its Planning Practice Guidance website (<http://planningguidance.planningportal.gov.uk>). *A number of sections of the Planning Practice Guidance website (now <https://www.gov.uk/government/collections/planning-practice-guidance>) have been updated one or more times since it was first launched.*
- On 12 February 2014, the Council's Cabinet authorised the preparation of a new Local Plan for Thurrock. *On 26 February 2016, the 'Thurrock Local Plan Issues & Options (Stage 1)' (February 2016) was published for consultation for six weeks following which the 'Thurrock Local Plan Issues & Options (Stage 1) Report of Consultation' (September 2016) was published. More recently, on 12 December 2018, the Council published the 'Thurrock Local Plan Issues & Options (Stage 2)' (December 2018) for consultation. The consultation closed on 8 March 2019.*
- *As part of the emerging Local Plan work, Thurrock Council has commissioned (jointly with other local authorities in certain cases) technical studies to serve as evidence to inform the emerging Local Plan. These include: 'South Essex Economic*

²⁴ Spalding Energy Expansion Section 36 Consent (dated January 2018). Available at: <https://itportal.beis.gov.uk/EIP/pages/projects/SpaldingEnergyExpansionTrackedChangesSection36ConsentandConditions31.01.18.pdf>

Development Needs Assessment' (2017); 'Thurrock Green Belt Stage 1 Assessment' (2018); and, 'Thurrock Strategic Flood Risk Assessment Update' (2018).

- On 18 November 2015, the Secretary of State for Energy and Climate Change announced "a new direction for UK energy policy". On 24 July 2017, the UK Government and OFGEM published 'Upgrading Our Energy System: Smart Systems and Flexibility Plan' (July 2017) and on 12 October 2017 DBEIS published 'The Clean Growth Strategy: Leading the way to a low carbon future' (October 2017 amended April 2018) which is referred to in the Government's Industrial Strategy 'Building a Britain fit for the future' (2017).

3.3.2 The following parts of this Section explain the above changes in respect of the NPSs, the NPPF, the Core Strategy (since the submission of the ES FID December 2010 and, where there has been further change(s), since the August 2014 ES FID and the February 2016 ES FID) and Planning Practice Guidance to the extent that this is relevant to the Proposed Development.

National Policy Statements for Energy

3.3.3 Since the February 2016 ES FID, the NPSs remain designated and there have been no associated changes. However, for completeness this Section considers four of the six NPSs which are relevant to the 2019 Variation Application. Again, *green italic text has been added to highlight the updates.*

Overarching National Policy Statement for Energy (EN-1)

3.3.4 Overarching National Policy Statement for Energy (EN-1) sets out national policy for defined energy infrastructure. The NPS, combined with the relevant technology specific NPSs, provides the primary basis for decisions (paragraph 1.1.1). Section 1.4 refers to the Planning Act 2008, setting out the threshold for nationally significant infrastructure projects (NSIPs) in the energy sector, namely as including onshore generating stations of more than 50 MW (and offshore generating stations of more than 100 MW), produced from fossil fuels, wind, biomass, waste and nuclear (EN-1, paragraph 1.4.2). Other forms of energy NSIPs include electricity lines at or above 132 kV, large gas reception and liquefied natural gas (LNG) facilities, underground gas storage and cross-country gas / oil pipelines, subject to specified thresholds.

3.3.5 Part 2 of EN-1 concerning Government policy on energy and energy infrastructure development states that: "*energy is vital to economic prosperity and social well-being and so it is important to ensure that the UK has secure and affordable energy*", and that: "*producing the energy the UK requires and getting it to where it is needed necessitates a significant amount of infrastructure both large and small*" (EN-1, 2.1.2). It is also stated that: "*the role of the planning system is to provide a framework which permits the construction of whatever Government - and players in the market responding to rules, incentives or signals from Government - have identified as the types of infrastructure we need in the places where it is acceptable in planning terms*" (EN-1, 2.2.4).

3.3.6 It considers that in making the transition to a low carbon economy, it is critical that the UK continues to have secure and reliable supplies of electricity. To manage the risks, of achieving security of supply we need (EN-1, 2.2.20):

- sufficient electricity capacity (including a greater proportion of low carbon generation) to meet demand at all times, which requires a safety margin of spare capacity to accommodate unforeseen fluctuations;
- reliable associated fuel supply chains e.g. for power stations, must be able to meet demand as it arises
- a diverse mix of technologies and fuels, so as not to be reliant on any one technology or fuel; and
- effective price signals so that market participants have sufficient incentives to react in a timely way to minimise supply / demand imbalances.

3.3.7 In the medium term, there are "*challenges*" to be faced, including the replacement of power plants due for closure (EN-1, 2.2.21) and, while an objective is to deliver more power from renewables and nuclear and to deliver Carbon Capture and Storage (CCS), it

is accepted that some fossil fuels for electricity generation will still be needed during the transition to a low carbon economy (EN-1, 2.2.23).

3.3.8 Part 3 of EN-1 considers the need for new NSIP projects. Section 3.1 sets out “*the planning policy*”, stating:

“The UK needs all the types of energy infrastructure covered by this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions.

It is for industry to propose new energy infrastructure projects within the strategic framework set by Government. The Government does not consider it appropriate for planning policy to set targets for or limits on different technologies.

The [relevant authority] should therefore assess all applications for development consent for the types of infrastructure covered by the energy NPSs on the basis that the Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need is as described for each of them in this Part.

The [relevant authority] should give substantial weight to the contribution which projects would make towards satisfying this need when considering applications for... consent ...”.

3.3.9 It is explained, with regard to the need for new NSIPs, that electricity meets a significant proportion of our overall energy needs and that the country’s reliance on it is likely to increase (3.3.1). EN-1 therefore discusses: meeting energy security and carbon reduction objectives; the need to replace closing electricity generating capacity; the need for more electricity capacity to support an increased supply from renewables; future increases in electricity demand; the urgency of the need for new electricity capacity; alternatives to new large scale electricity generation capacity by reducing demand more intelligent use of electricity and interconnection of electricity systems (Section 3.3).

3.3.10 Table 3.1 summaries the need for new electricity NSIPs as expressed in EN-1.

TABLE 3.1: NEED FOR NEW ELECTRICITY NSIPs

Topic	Explanation
(3.3.2 – 3.3.6) Meeting Energy Security and Carbon Reduction Objectives	There needs to be sufficient electricity generating capacity to meet maximum peak demand with a safety margin, or spare capacity; the larger the safety margin, the more resilient the system. There are benefits of having a diverse mix of all types of power generation: <ul style="list-style-type: none"> • Nuclear is a proven technology, able to provide continuous low carbon generation, capable of responding to variations in demand but it is not as cost efficient used in this way compared to fossil fuel generation; • Renewables offer a low carbon and proven source but many are intermittent; • Fossil fuel generation is responsive, complementing generation from nuclear and intermittent renewables but without CCS will not be low carbon. Government would like industry to bring forward many new low carbon developments (renewables, nuclear and fossil fuel generation with CCS) but it is for industry to propose what is viable, while decisions should be in accordance with the policy in Section 3.
(3.3.7 – 3.3.9) Need to Replace Closing Electricity Generating Capacity	In the UK, at least 22 GW of existing generating capacity must be replaced in the coming years, (particularly to 2020), comprising about 12 GW of coal / oil generating plant due to close as a result of the Large Combustion Plant Directive (LCPD) by 2015 and 10 GW of nuclear over the subsequent 20 years with further closures resulting from the Industrial Emissions (Integrated Pollution Prevention and Control) Directive.

<i>Topic</i>	<i>Explanation</i>
(3.3.10 – 3.3.12) Need for More Electricity Capacity to support increased supply from renewables	The Government is committed to dramatically increasing the amount of renewable generation; it will help to improve energy security, however, wind, solar, tidal energy are intermittent and cannot be adjusted to meet demand. Increased renewables will require additional back up capacity, requiring increased total electricity capacity; even when electricity supplies are almost entirely decarbonised, fossil fuel power stations may still be required for short periods.
(3.3.13 – 3.3.14) Future Increases in Electricity Demand	Increasing the supply of low carbon electricity is an essential pre-requisite for the switch away from fossil fuels, which will further substantially increase demand for electricity consumption (measured in terawatt hours over a year) could double by 2050.
(3.3.15 – 3.3.24) Urgency of the Need for New Electricity Capacity	There is an urgent need for new (and particularly low carbon) energy NSIPs to be brought forward as soon as possible (note fossil fuel generation with CCS can be low carbon (3.3.5)). EN-1 refers to a potential larger amount of generating capacity being required, based on the Updated Energy & Emissions Projections (UEP) (June 2010); the “ <i>high fossil fuel and carbon price scenario</i> ” would indicate that, by 2025, the UK might need around 113 GW of total electricity capacity (compared to around 85 GW now), of which some 59 GW would be new build. It was expected of the majority of new build capacity would be from renewable technologies and the balance from non-renewable capacity.
(3.3.26 – 3.3.34) Alternatives to New Large Scale Electricity Generation	Government has considered means of reducing demand, more intelligent use of electricity and interconnection of electricity systems as alternatives to new large scale generating capacity. It has found that current policies will reduce electricity demand in certain areas but savings will be offset by increases in other areas; decentralised and community energy systems could lead to some reduction in demand; however, Government does not believe this will lead to significant replacement of larger scale infrastructure, which offers economic and other benefits such as more efficient bulk transfer of power. It is expected that demand side response, storage and interconnection will play important roles in a low carbon electricity system but still envisages backup capacity being necessary to ensure security of supply until other storage technologies reach maturity. Increased investment in interconnection is unlikely to reduce the need for new infrastructure to any great extent. Overall, the Government believes that, while these measures should be actively pursued, their effect on the need for new large scale energy infrastructure will be limited, particularly given the likely increased need for electricity for domestic / industrial heating and transport.

- 3.3.11 Fossil fuel power stations play a vital role in providing reliable electricity supplies; they can be operated flexibly in response to changes in supply / demand, provide diversity in energy mix and continue to play an important role as the UK makes the transition to a low carbon economy (3.6.1). Gas will continue to play an important role in the electricity sector; the UK gas market has diversified its sources of supply, supported by investment in LNG facilities (3.6.1). Some of the new conventional generating capacity needed, is likely to come from new fossil fuel plants that will provide some of the new capacity to maintain security of supply and to provide flexible backup for intermittent renewable energy from wind. While all fossil fuels generate emissions of carbon dioxide, coal typically produces about twice as much per unit of electricity generated than gas (3.6.3).
- 3.3.12 CCS offers the potential to reduce CO₂ emissions of up to 90%; the complete chain of CCS has yet to be demonstrated at commercial scale on a power station; there is

however a high level of confidence that the technology will be effective but there is less known about the impact of CCS on the economics of power station operation (3.6.4-6).

- 3.3.13 Part 4 of EN-1 (Assessment Principles) sets out certain general policies with which applications for energy infrastructure are to be decided, other than need (covered in Part 3) or to particular physical impacts (covered in Part 5) and the relevant technology specific NPSs. It is restated that given the level and urgency of need for infrastructure of the types covered by energy NPSs, decision making should start with a presumption in favour of granting consent to energy NSIP applications (4.1.2). The decision maker should also take into account potential benefits, including the contribution to meeting the need for energy infrastructure, job creation, long term or wider benefits, also environmental, social and economic benefits, as well as potential adverse impacts and any measures to avoid, reduce or compensate for such effects (4.1.3 – 4.1.4). The matters considered in Part 4 are environmental statement and likely significant effects; the Conservation of Habitats and Species Regulations 2010; alternatives considered; criteria for good design for energy infrastructure; consideration of CHP; CCS and CCR; climate change adaptation; grid connection; pollution control and other environmental regulatory regimes; safety; hazardous substances; health; common law nuisance and statutory nuisance and security considerations.
- 3.3.14 Of the above; relevant matters have been addressed in the EIA process and presented in the ES and accompanying documents (4.2). In particular, it is advised that the question of whether a project is likely to have a significant effect on a European designated site (or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects should be considered (4.3). The approach taken in this case at the screening stage has been to follow the approach taken in the Waddenzee²⁵ case namely: *"45. In the light of the foregoing, the answer to Question 3(a) must be that the first sentence of Art.6(3) of the Habitats Directive must be interpreted as meaning that any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects"*.
- 3.3.15 The NPS does not contain any general policy requirement to consider alternatives, or to establish whether the proposed project represents the best option; however applicants are obliged to include information about the main alternative studied, including the main reasons for their choice, taking into account the environmental, social and economic benefits, including where relevant technical and commercial feasibility (4.4.1 – 4.4.2).
- 3.3.16 In considering design (4.5), the relevant authority needs to be satisfied that the development will produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy, matched by appearance that demonstration good aesthetics as far as possible, although the nature of energy development, will often limit the extent to which it can contribute to the enhancement of the quality of the area. Other considerations are whether the development is as attractive, durable and adaptable as it can be and that the applicant has taken into account both functionality and aesthetics (see the February 2010 Design and Access Statement and the December 2010 Revised Design and Access Statement).
- 3.3.17 On CHP (4.6), it notes that CHP may either supply steam direct to customers or capture waste heat for low pressure steam, hot water or space heating after it has been used to drive electricity generating turbines. Reference is made (4.6.6) to existing guidelines issued by DECC 2006 on information required to accompany applications for Section 36 Consent, containing evidence that the possibilities for CHP have been fully explored (see the February 2010 CHP Assessment and the December 2010 Supplementary CHP Assessment).
- 3.3.18 Matters relating to CCR (4.7) are discussed comprehensively in the February 2010 CCR Feasibility Study, the August 2014 Updated CCR Feasibility Study (and the accompanying report by Imperial College London) *and the 2019 Updated CCR Feasibility Study*.

²⁵ Landelijke Vereniging tot Behoud van de Waddenzee, Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris Van Landbouw, Natuurbeheer en Visserij [2005] Env. L.R. 14.

- 3.3.19 There is advice on how applicants and the relevant authority should take the effects of climate change into account when planning the location, design, build, operation and decommissioning of infrastructure; there should be no critical features of the design which may be seriously affected by more radical changes in the climate; any adaptation measures should themselves be assessed (4.8). Grid connection (4.9) is not part of this application (although the implications were considered in the Original Consent Application); planning permission was granted by the Council in 2013 for a high voltage underground electrical connection. Planning and pollution control systems are separate but complementary (4.10) advising that the relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework and that cumulative effects of pollution would not make the development unacceptable; accordingly, the relevant authority should not refuse consent on the basis of pollution impacts, unless it has good reason to believe that any necessary operational pollution control permits or licences, or other consents will not subsequently be granted (4.10.7 – 4.10.8). The EIA process has demonstrated that, in this case, the pollution control matters can be satisfied. Additional considerations of safety, hazardous substances, health, common law nuisance and statutory nuisance and security considerations are not an issue for purposes of *this 2019 Variation Application*.
- 3.3.20 Part 5 of EN-1 sets out generic impacts to be considered, namely air quality and emissions; biodiversity / geological conservation; civil / military aviation / defence interests; coastal change; dust, odour, artificial light, smoke, steam, insect infestation; flood risk; historic environment; landscape / visual impacts; land use including open space, green infrastructure, Green Belt; noise / vibration; socio-economic; traffic / transport impacts; waste management; water quality / resources. These matters have been addressed in the EIA process where appropriate.
- [National Policy Statement for Fossil Fuel Electricity Generating Infrastructure \(EN-2\)](#)
- 3.3.21 Part 1 of EN-2 states that this NPS, with EN-1, provides the primary basis under the Planning Act 2008 for decisions on applications for nationally significant fossil fuel electricity generating stations as defined at section 1.8. EN-2 covers electricity generating infrastructure over 50 MW, namely coal fired, gas fired, integrated coal gasification combined cycle and oil-fired (1.8.1).
- 3.3.22 Part 2 of EN-2 notes that the policies set out in this NPS are additional to those on generic impacts in EN-1; it concludes that there is a significant need for new major energy infrastructure and that, in the light of this, the need for the infrastructure covered by this NPS has been demonstrated (2.1.2). It refers to the factors influencing site selection by developers as land use, transport infrastructure, water resources and grid connection (2.2). On the matter of Government policy criteria for fossil fuel generating stations; the following must be met before consent can be given, namely CHP; CCR; CCS (for coal fired generating stations); climate change adaptation; consideration of “good design” (2.3). Consideration is also given to impacts of fossil fuel generating stations in respect of air quality and emissions; landscape and visual impact; noise / vibration; release of dust (by coal-fired generating stations); residue management (for coal-fired generating stations); water quality / resources (2.4). All relevant considerations have been addressed in the EIA process.
- [National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines \(EN-4\)](#)
- 3.3.23 Part 1 of EN-4 states that this NPS, with EN-1, provides the primary basis under the Planning Act 2008 for decisions on applications for gas supply infrastructure and gas and oil pipelines defined in Section 1.8.
- 3.3.24 The underground gas pipeline associated with the GEC is not an NSIP, however when the application for planning permission was submitted to Thurrock Thames Gateway Development Corporation reference was made in the application to EN-4 and EN-1 as material considerations. Planning permission for the underground gas pipeline and associated AGI was granted on 8 March 2012. *This planning permission has been implemented.*
- 3.3.25 *Similarly the proposed new underground gas pipeline is not an NSIP and will be the subject of an application for planning permission to the LPA; EN-4 and EN-1 are likely to remain material considerations.*

[National Policy Statement for Electricity Networks Infrastructure \(EN-5\)](#)

- 3.3.26 Part 1 of EN-5 states that this NPS, with EN-1, provides the primary basis under the Planning Act 2008 for decisions on applications for electrical networks infrastructure defined at Section 1.8.
- 3.3.27 The HV underground electrical connection and associated extension of the Coryton South Substation is not an NSIP, however when the application was submitted to Thurrock Borough Council reference was made to EN-5 and EN-1 as material considerations. Planning permission for the HV underground electrical connection was granted on 27 February 2013. *This development was not commenced, and the planning permission has since expired.*

[Other National Policy Statements](#)

- 3.3.28 On 26 February 2016, the National Policy Statement for Ports (NPSP) was designated. The Government's assessment of the need for new infrastructure is that, despite the then recent recession, it believed that there is a compelling need for substantial additional port capacity (3.4.16).

[National Planning Policy Framework](#)

- 3.3.29 As explained in the August 2014 ES FID and the February 2016 ES FID, since the December 2010 ES FID, the NPPF (2012) was published which set out the Government's planning policies for England and how they were to be applied and in doing so revoked and replaced a number of policy documents that were referred to variously in the December 2010 ES FID.
- 3.3.30 Since the February 2016 ES FID, the NPPF (2012) has been replaced by a revised NPPF (2019). This Sections consider where the revised NPPF (2019) affects the summary of the original NPPF (2012) which was presented in the February 2016 ES FID. Again, *green italic text has been added to highlight the updates.*
- 3.3.31 The NPPF restates the legal position that planning law requires that applications for planning permission must be determined in accordance with the development plan (section 38(6) PCPA 2004) unless material considerations indicate otherwise. The NPPF must be taken into account in plan making and is a material consideration in planning decisions (paragraph 2). The duty imposed by section 38(6) of the PCPA 2004 does not apply to the Secretary of State when considering whether to direct that planning permission be deemed to be granted²⁶.
- 3.3.32 There are no specific policies for NSIPs in the NPPF. Such applications are to be determined in accordance with the Planning Act 2008 and relevant NPSs. NPSs "*form part of the overall framework of national planning policy and may be a material consideration in ... making decisions on planning applications*" (paragraph 5).
- 3.3.33 On the matter of achieving sustainable development, it is stated that: "*the purpose of the planning system is to contribute to the achievement of sustainable development*" (paragraph 7), meaning that: "*the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives)*" (paragraph 8).
- 3.3.34 The three dimensions to sustainable development are defined as: "*economic, social and environmental*"; the economic role refers to building a strong, responsive, competitive economy, including *by supporting growth and innovation and* the provision of infrastructure; the environmental role includes moving to a low carbon economy; low carbon technologies are defined as those that can help reduce emissions, compared to conventional use of fossil fuels (*Annex 2: Glossary*). *The NPPF explains that these objectives should be delivered through the preparation and implementation of plans and the application of the policies in the NPPF and are not criteria against which every decision can or should be judged (paragraph 9).*

²⁶ *R(on the application of Samuel Smith Old Brewery) v. Secretary of State for Energy and Climate Change* [2012] EWHC 46 (Admin) (paragraphs 79 and 80).

- 3.3.35 *There is a presumption in favour of sustainable development (paragraphs 10/11), which means LPAs approving development without delay where it accords with an up-to-date development plan. In cases where there are no relevant development plan policies or the policies which are most important for determining the application are out-of-date, granting planning permission unless adverse impacts would significantly / demonstrably outweigh the benefits when assessed against policies in the NPPF, taken as a whole or if the application of policies in the NPPF that protect areas or assets of particular importance provides a clear reason not to. The latter category of policies comprise those relating to habitats sites (i.e. those included within the definition of 'European site' at regulation 8 of the Conservation of Habitats and Species Regulations 2017, including candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, Special Protection Areas and any relevant Marine Sites) and potential Special Protection Areas and possible Special Areas of Conservation; listed or proposed Ramsar sites²⁷; and sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites and / or designated as Sites of Special Scientific Interest; land designated as Green Belt, Local Green Space, an Area of Outstanding Natural Beauty, a National Park (or within the Broads Authority) or defined as Heritage Coast; irreplaceable habitats; designated heritage assets (and other heritage assets of archaeological interest referred to in footnote 63); and areas at risk of flooding or coastal change.*
- 3.3.36 *The twelve core planning principles identified in the first NPPF (2012) as referred to in the August 2014 ED FID (at paragraph 3.3.5) and the February 2016 ES FID (at paragraph 3.3.26) are no longer identified as such in the revised NPPF (2019), albeit it the thrust of these principles are still reflected variously within the revised NPPF (2019).*
- 3.3.37 Building a strong competitive economy is to be achieved by the following:
- *Creating the conditions in which businesses can invest, expand and adapt, which should be assisted by planning policies and decisions, which is particularly important where Britain can be a global leader in driving innovation (paragraph 80). A footnote explains that the Government's Industrial Strategy sets out a vision to make the UK a leader in four 'Grand Challenges' facing all nations, one of which is 'Clean Growth' which is described in the Government's Clean Growth Strategy²⁸ as growing national income while cutting greenhouse emissions. The transition from coal to low carbon (natural gas) and renewables in the power generation sector is recognised as an important component of this, as is energy storage.*
 - *Recognising, through planning policies and decisions, the specific locational requirements of different sectors (paragraph 82).*
- 3.3.38 The fundamental aim of Green Belt is to keep land permanently open; the essential characteristics of Green Belt are its openness and permanence (paragraph 133). *"Inappropriate development is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances"* (paragraph 143). However *"Certain ... forms of development are also not inappropriate in Green Belt provided they preserve its openness and do not conflict with the purposes of including land within it"* (paragraph 146). This category includes engineering operations. *There is specific recognition that the wider environmental benefits associated with increased production of energy from renewable sources may constitute very special circumstances (paragraph 147).*
- 3.3.39 Other policies relevant to the achievement of sustainable development concern:
- Meeting the challenge of climate change, flooding and coastal change (paragraphs 148 – 169);
 - Conserving and enhancing the natural environment (paragraphs 170 – 183); and,
 - Conserving and enhancing the historic environment (paragraphs 184 – 202).

²⁷ *"Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site"* (footnote 59, paragraph 176 of NPPF).

²⁸ *The Government's approach to "Clean Growth" is set out in 'The Clean Growth Strategy: Leading the way to a low carbon future' (October 2017 amended April 2018), DBEIS.*

These items are considered briefly below.

- 3.3.40 Among its many roles, *the planning system* is required to support the: *“transition to a low carbon future in a changing climate”, which includes supporting: “renewable and low carbon energy and associated infrastructure”*. LPAs should have a positive strategy to maximise renewable / low carbon energy and should consider identifying suitable areas *as well as identifying opportunities for development to draw its energy supply from such energy supply systems and for co-locating potential heat customers and suppliers (paragraph 151)*. When determining applications, LPAs should *“not require applicants to demonstrate the overall need for renewable or low carbon energy”* (paragraph 154).
- 3.3.41 On the matter of flood risk, there is advice that: *“Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere”* (paragraph 155). The NPPF explains that a Sequential Test should first be applied to steer new development to areas with the lowest probability of flooding (paragraph 101); however, if, following application of the Sequential Test it is not possible, consistent with wider sustainability objectives to locate development in zones with a lower probability of flooding, the Exception Test can be applied if appropriate (paragraphs 158/159). This requires that the development must provide wider sustainability benefits to the community which outweigh flood risk, while demonstrating that the development will be safe for its lifetime, taking account of the vulnerability of its users without increasing flood risk elsewhere (paragraph 160).
- 3.3.42 The Technical Guidance to the NPPF was archived and replaced by the New Planning Practice Guidance (PPG) *first* launched on 6 March 2014 *and updated on an ad hoc basis since then*. The PPG on Flood Risk includes Table 2: Flood Risk Vulnerability Classification which defines essential utility infrastructure as that *“which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations...”*.
- 3.3.43 On the matter of conserving and enhancing the natural environment, the planning system (*planning policies and decisions*) is required to contribute to and enhance the natural and local environment *including by protecting sites of biodiversity value in a manner commensurate with their statutory status or identified quality in the development plan and by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution (paragraph 170)*. *Plans should* allocate land for development with the least environmental / amenity value, *where consistent with other policies in the NPPF (paragraph 171)*. When determining applications, LPAs should *refuse planning permission if significant harm to biodiversity resulting from a development cannot be avoided, adequately mitigated or as a last resort compensated for and development likely to have an adverse effect on a Site of Scientific Interest (either individually or in combination with other developments) should not normally be permitted, unless the benefits of the development in the location proposed clearly outweigh the impact (paragraph 175)*.
- 3.3.44 With regard to the historic environment, LPAs should adopt a positive strategy for the conservation and enjoyment of the historic environment (paragraph 185), while in determining applications, the level of detail required should be: *“proportionate to the assets”* importance (paragraph 189).
- 3.3.45 *The advice on plan-making includes that it should be prepared with the objective of contributing to the achievement of sustainable development*. On the matter of infrastructure, LPA’s strategic policies should make sufficient provision for infrastructure including infrastructure for the provision of *“energy (and heat)”* (paragraph 20). *National policy statements relating to major infrastructure: “which form part of the overall framework of national planning policy, and may be a material consideration in preparing plans” (paragraph 5)*.
- 3.3.46 *The following planning guidance documents* referred to variously in the February 2010 ES and the December 2010 ES FID *were revoked by the first NPPF and remain revoked*:
- Planning Policy Statement:
Delivering Sustainable Development (31 January 2005)

- Planning Policy Statement:
Planning and Climate Change – Supplement to Planning Policy Statement 1 (17 December 2007)
- Planning Policy Guidance 2: Green Belts (24 January 1995)
- Planning Policy Statement 4:
Planning for Sustainable Economic Growth (29 December 2009)
- Planning Policy Statement 5:
Planning for the Historic Environment (23 March 2010)
- Planning Policy Statement 9:
Biodiversity and Geological Conservation (16 August 2005)
- Planning Policy Guidance 13:
Transport (3 January 2011)
- Planning Policy Statement 22:
Renewable Energy (10 August 2004)
- Planning Policy Statement 23:
Planning and Pollution Control (3 November 2004)
- Planning Policy Guidance 24:
Planning and Noise (3 October 1994)
- Planning Policy Statement 25:
Development and Flood Risk (29 March 2010)
- Circular 05/2005: Planning Obligations (18 July 2005)

Planning Practice Guidance

3.3.47 On 6 March 2014, DCLG launched its Planning Practice Guidance website <http://planningguidance.planningportal.gov.uk>. This replaced numerous previous planning guidance documents, providing online guidance. *A number of sections of the Planning Practice Guidance website (now <https://www.gov.uk/government/collections/planning-practice-guidance>) have been updated one or more times since it was first launched.*

3.3.48 Table 3.2 summarises relevant Planning Practice Guidance categories of and the relevant sections in 2019 ES FID.

TABLE 3.2: RELEVANT PLANNING PRACTICE GUIDANCE CATEGORIES, AND THIS 2019 ES FID

<i>Guidance Category</i>	<i>Relevant Section of this 2019 ES FID</i>
Air Quality	<i>Section 8: Air Quality</i>
Conserving and Enhancing the Historic Environment	<i>Section 15: Historic Environment</i>
Flood Risk and Coastal Change	<i>Section 13: Water Resources and Flood Risk. Also see the 2019 Updated Flood Risk Assessment.</i>
Land Affected by Contamination	<i>Section 12: Ground Conditions (Geology and Land Contamination)</i>
Light Pollution	<i>Section 10: Landscape and Visual</i>
Natural Environment, Ecology	<i>Section 11: Ecology</i>
Noise	<i>Section 9: Noise and Vibration</i>
Transport Evidence Bases in Plan Making and Decision Taking	<i>Section 14: Traffic and Transport Infrastructure</i>

Guidance Category	Relevant Section of this 2019 ES FID
Travel Plans, Transport Assessments and Statements	<i>Section 14: Traffic and Transport Infrastructure</i>
Water Supply, Wastewater and Water Quality	<i>Section 12: Ground Conditions (Geology and Land Contamination)</i> <i>Section 13: Water Resources and Flood Risk</i>

Local Policy

Thurrock Core Strategy and Policies for Management of Development 2011

- 3.3.49 Since the February 2016 ES FID, the Thurrock Core Strategy and Policies for Management of Development (2011) remains the relevant component of the development plan for the purposes of decisions on applications for planning permission. As such the only update to the summary of local policy relates to how the identified policies are relevant to this 2019 Variation Application. Again, *green italic text has been added to highlight the updates.*
- 3.3.50 On 21 December 2011, Thurrock Council formally adopted its Core Strategy and Policies for Management of Development, the document was subsequently updated on 28 January 2015 following a consistency review with the NPPF (2012). The Core Strategy remains Thurrock Council's primary adopted planning policy document until their new Local Plan is adopted, which is expected in 2022.
- 3.3.51 The Core Strategy introduced the concept of strategic spatial objectives (SSO); core strategic spatial policies (CSSP) to deliver the spatial vision and objectives; core strategic thematic policies (CSTP) to achieve the best outcomes to themes in the CSSPs and policies for management of development (PMD). *The following are relevant to the 2019 Variation Application: [strategic spatial objectives] SS02 Employment Growth; SS03 Supporting Investment; SS010 Safe Transport; SS011 Enhance Green Belt; SS012 Protect the Environment; SS013 Enhance Biodiversity; SS014 Sustainable Development; SS017 Climate Change; SS018 Flood Risk; [spatial policies] CSSP2 Sustainable Employment Growth; CSSP3 Sustainable Infrastructure; CSSP4 Sustainable Green Belt; CSSP5 Sustainable Greengrid; [thematic policies] CSTP6 Strategic Employment; CSTP12 Education and Learning; CSTP13 Emergency Services and Utilities; CSTP18 Green Infrastructure; CSTP19 Biodiversity; CSTP21 Productive Land; CSTP22 Design; CSTP23 Character and Distinctiveness; CSTP24 Heritage; CSTP25 Climate Change; CSTP26 Renewable or Low-Carbon Energy Generation; and, CSTP27 Management and Reduction of Flood Risk.*
- 3.3.52 In addition to the above, the following Core Strategy development management policies relevant to the 2019 Variation Application: PMD1 Minimising Pollution and Impacts on Amenity; PMD2 Design and Layout; PMD4 Tall Buildings; PMD6 Developing on the Green Belt; PMD7 Biodiversity, Geological Conservation and Development; PMD9 Road Network Hierarchy; PMD10 Transport Assessments and Travel Plans; PMD12 Sustainable Buildings; PMD13 Decentralised, Renewable and Low Carbon Energy; PMD14 Carbon Neutral Development; PMD15 Flood Risk Assessment; and, PMD16 Developer Contributions. These policies are relevant to GEC and have also been a consideration when planning permission was granted on 8 March 2012 by the former Thurrock Thames Gateway Development Corporation for the proposed underground gas pipeline and associated AGI and by Thurrock Borough Council when planning permission was granted on 27 February 2013 for the HV underground electrical connection associated and associated extension of the Coryton Substation.
- 3.3.53 The effect of the Focused Review (28 January 2015) is to introduce an additional policy OSDP1 inserted into Chapter 3 and to amend certain policies, also referred to as replacement policies into Chapters 4, 5 and 6. *These policies were highlighted in the February 2016 ES FID and are also referred to below.*
- 3.3.54 Chapter 3 (The Future of Thurrock) sets the context for the spatial vision and strategic objectives for Thurrock. It notes that there is a need to diversify Thurrock's economic base to provide the local community with more training and employment opportunities in

the growth sectors; *"its policies aim to ensure that growth in local businesses is supported and promoted"* (3.8(8)). In referring to the five Key Areas of Regeneration and Growth Locations, London Gateway (LG) is identified as: *"a major logistics, import-export based employment development"* with 11,000 to 13,000 jobs created to secure the long-term future of the industry in Thurrock; it envisages that: *"Development of ancillary, associated and spin-off employment activities will take place on the wider employment site"*, and that: *"There is also potential scope for large-scale high quality campus style relocation or inward-investment business developments"* (3.38). Policy OSDP1 (Promoting Sustainable Growth and Regeneration in Thurrock) commits the Council to promoting sustainable growth in Thurrock that serves to regenerate its communities by proactively engaging with developers to deliver high quality sustainable development across all types of land uses and facilities.

- 3.3.55 The Core Strategy Table 3 sets out strategic spatial objectives (SSO), including: SSO2 increasing prosperity and employment growth in the five strategic economic hubs (including London Gateway); SSO3 supporting local businesses, attracting inward investment and high skill jobs, including environmental industries by providing appropriate sites; SSO10 providing a safe transport system that supports accessibility, manages the need to travel and encourages environmentally friendly modes of transport such as cycling, walking and public transport; SSO11 sustaining and enhancing the open character of the Green Belt and only allowing development in very special circumstances; SSO12 protecting the natural, historic and built environment; SSO13 developing the Greengrid network of biodiversity sites; SSO14 promoting sustainable development through the prudent use of water and other natural resources, using sustainable design methods and materials, and integration of land-use with the maximum re-use of land; SSO17 minimising the impact of climate change by supporting the provision of renewable and low carbon energy sources and ensuring that new development incorporates climate change adaptation; and, SSO18 reducing / managing risk of flooding through location, layout and design.

Spatial Policies

- 3.3.56 Chapter 4 Spatial Policies - identifies the Thames Gateway South Essex sub-region as one of the *"Engines of Growth"* for the region, in which LG and Tilbury Ports are one of two economic clusters (the other is Lakeside Basin) (paragraph 4.10). The Thurrock Economic Development Strategy 2009 (TEDS) focuses *"future growth upon the existing core economic sectors and the identified growth sectors"* (paragraph 4.11). It suggests that the growth sectors identified by the TEDS could offer additional sources of new employment and contribute to economic diversification, of which one is *"recycling and energy"* (paragraph 4.12). Policy CSSP2 (Sustainable Employment Growth) commits the Council to supporting economic development in the five key strategic economic hubs. For London Gateway, the policy refers to port, logistics and transport as core sectors; it names environmental technologies, recycling and energy as growth sectors and training / innovation / research and business / distribution park as flagship developments, producing an indicative job growth of 11,000 to 13,000 jobs in the period to 2026. Policy CSSP3 (Sustainable Infrastructure) recognises that essential social and physical infrastructure must be put in place to deliver regeneration in Thurrock; it refers to various infrastructure projects, including transport specific infrastructure at LG and a new power station at Tilbury.
- 3.3.57 Policy CSSP4 (Sustainable Green Belt), in seeking to deliver the objectives of PPG2 (now revoked and replaced by the NPPF), explains that the Council will maintain the permanence of the Green Belt boundaries, resist development where there would be any danger of coalescence and maximise opportunities for increased public access, leisure and biodiversity. It is stated that the Council will seek to reinforce the Green Belt boundary through structural enhancement of landscape and that development proposed in the Green Belt will have to *"fully comply with the relevant thematic and development management policies"*.
- 3.3.58 Policy CSSP5 (Sustainable Greengrid) includes measures to protect and manage Greengrid and deliver Improvement Zones.

Thematic Policies

Employment

- 3.3.59 Chapter 5 contains a number of thematic policies including core strategic policies concerning employment, environment, climate change, water, waste and strategic infrastructure. On the matter of strategic employment provision, Policy CSTP6 (Strategic Employment Provision) notes that the Thurrock Employment Study indicates that the 26000 person job target will be very challenging to deliver by 2026 (paragraph 5.48). The policy advises that the Council will safeguard existing primary and secondary industrial and commercial land but will consider economic development that includes non-B Class uses, provided certain criteria are met. It is noted in CSTP6 10 that the Council will work with partners and developers to enhance the knowledge and skills and local employment opportunities for residents (as GECL has already committed to in a Section 106 agreement).

Socially Inclusive Communities

- 3.3.60 Policy CSTP12 (Education and Learning) encourages, among others, opportunities for learning and training facilities, the co-ordination of new educational provision with new development, environmental, economic and social (educational and community) sustainability and that proposals for new development will be required to contribute towards education in accordance with Policies CSSP3, PMD16 and the Developer Contribution SPD. Policy CSTP13 (Emergency Services and Utilities) envisages the Council working with partners to ensure adequate provision of emergency services and utilities; this includes ensuring that facilities and services are located and designed to be resilient to flood risk to ensure continuity of services.

Environment

- 3.3.61 Policy CSTP18 (Green Infrastructure) is concerned with improving provision of the Borough's green assets and requiring new development to result in a net gain in green infrastructure including incorporating habitat / wildlife creation technologies within new development. Policy CSTP19 (Biodiversity) encourages measures to contribute positively to overall biodiversity in the Borough; to that end, the Council aims to safeguard and enhance designated sites to mitigate the effects of past habit loss, fragmentation, development and climate change and will prepare biodiversity management plans with partners. Policy CSTP21 (Productive Land) recognises the importance of food security and will ensure the protection, conservation and enhancement of agriculture, productive land and soil; development of the best and most versatile land will not be supported except in exceptional circumstances; productivity of land will be supported. Policy CSTP22 (Thurrock Design) seeks to achieve high quality design to improve the quality of the environment particularly in the Regeneration Areas and Key Strategic Employment Hubs including, by ensuring that development embraces the use of sustainable, renewable resources of energy and low-emissions technology. The policy supports a robust design process in which development should demonstrate respect for the distinct characteristics of areas and consider how to address the particular sensitivities and capacity of the places within which development is to occur, including how adverse impacts are mitigated. Policy CSTP23 (Thurrock Character and Distinctiveness) similarly seeks to protect, manage and enhance the character of Thurrock to ensure improved quality and strengthened sense of place by identifying areas where character is a key issue, including Regeneration Areas, Key Strategic Employment Hubs and Green Belt and by retaining and enhancing significant natural, historic and built features and strategic and local views which contribute to the character and sense of place of the Borough. Policy CSTP24 (Heritage Assets and the Historic Environment) requires the preservation or enhancement of the historic environment and that all development proposals should accordingly consider and appraise development options and demonstrate that the final proposal is the most appropriate for the heritage asset and its setting.

Climate Change

- 3.3.62 Policy CSTP25 (Addressing Climate Change) requires development to address climate change adaptation measures, including reduction of emissions, renewable and low carbon technologies, passive design, recycling and waste minimisation, also ensuring that vulnerability to climate change impacts is minimised, reductions in CO₂ emissions.

- 3.3.63 Policy CSTP26 (Renewable or Low-Carbon Energy Generation) states that the Council will promote and facilitate proposals for centralised renewable or low carbon energy schemes at appropriate locations and standards including at Tilbury and London Gateway. This includes the delivery of renewable and low-carbon energy (utilising technologies such as combined heat and power). GECL has already committed in a Section 106 agreement to working with the Council on the potential delivery of CHP.

Water, Riverside, Coastal

- 3.3.64 Policy CSTP27 (Management and Reduction in Flood Risk) commits to using land use planning to implement and support flood risk management. The sequential and where necessary exception tests as set out in the NPPF and associated Planning Practice Guidance will be employed when allocating sites for development and an Emergency Plan for the Borough will be completed.

Policies for Management of Development

- 3.3.65 Chapter 6 includes a number of policies for the management of development.
- 3.3.66 Policy PMD1 (Minimising Pollution and Impacts on Amenity, Health Safety and the Natural Environment) states that development will not be permitted where it would or is likely to cause unacceptable effects on the amenities of an area, health or safety of neighbouring or future occupiers or the natural environment. It states that particular consideration will be given to the location of sensitive land uses such as housing, schools, health facilities and biodiversity sites; where necessary, the Council may require applications to address matters including air / noise pollution, contaminated land, odour, light and water pollution, visual intrusion, loss of light, ground instability, vibrations etc.
- 3.3.67 Policy PMD2 (Design and Layout) requires all design proposals to respond to the sensitivity of the site and its surroundings to optimise its potential to accommodate development and to mitigate against negative impacts.
- 3.3.68 Policy PMD4 (Historic Environment) seeks to ensure that the fabric and setting of heritage assets, including listed buildings, conservation areas, scheduled ancient monuments and other important archaeological sites, and historic landscape features are appropriately protected and enhanced.
- 3.3.69 Policy PMD6 (Development in the Green Belt) is concerned with maintaining, protecting and enhancing the open character of the Green Belt in Thurrock in accordance with the provision of the NPPF.
- 3.3.70 Policy PMD7 (Biodiversity, Geological Conservation and Development) requires development proposals to demonstrate that any significant biodiversity habitat or geological interest of recognised local value is retained and enhanced on site; where this is not possible and there is no suitable alternative site available for the development, such loss must be mitigated and, if mitigation is not possible, developers should provide appropriate compensation within Thurrock, taking into account that the Council will seek to achieve net gains in biodiversity.
- 3.3.71 Policy PMD9 (Road Network Hierarchy) is included to ensure that proposals for development affecting the highway will be considered in relation to the road network hierarchy and the function of each level of that hierarchy; thereby mitigating adverse impacts on the transport system, including capacity, safety, air quality and noise (paragraph 6.46).
- 3.3.72 Policy PMD10 (Transport Assessments and Travel Plans) requires applications for planning permission to be accompanied by Transport Assessments, Transport Statements, and Travel Plans in accordance with the Department for Transport guidance.
- 3.3.73 Policy PMD12 (Sustainable Buildings) requires non-residential development over 1000 m² to achieve specified BREEM standards or equivalent; these may be relaxed where it can be proved that the requirements would be unviable; also energy and water statements should address how the development will minimise water / energy consumption; maximise water efficiency / water recycling; the use of recycled materials and to minimising waste and maximise recycling during construction and after completion.

- 3.3.74 Policy PMD13 (Decentralised Renewable and Low-Carbon Energy Generation) supports decentralised, renewable or low-carbon energy and the provision of district energy networks to serve new development.
- 3.3.75 Policy PMD14 (Carbon Neutral Development) requires developers to demonstrate that all viable energy efficiency measures and renewable or low-carbon technology opportunities have been utilised to minimise emissions.
- 3.3.76 Policy PMD15 (Flood Risk Assessment) requires the management of flood risk to be considered at all stages of the planning process (*see the 2019 Updated Flood Risk Assessment which accompanies the 2019 Variation Application*).
- 3.3.77 Policy PMD16 (Developer Contributions) states that, where needs would arise as a result of development, the Council will seek to secure planning obligations under Section 106 of the TCPA 1990 and in accordance with the NPPF and any other relevant guidance. GECL entered into a Section 106 agreement with Thurrock Council prior to the issue of the Original Consent.

[Thurrock Local Plan Issues & Options \(Stage 2\) \(December 2018\)](#)

- 3.3.78 Thurrock Council is preparing a new Local Plan which in due course will replace the Thurrock Core Strategy and Policies for Management of Development (2011). Public consultation took place on the Thurrock Local Plan Issues & Options (Stage 1) in (February 2016) in early 2016 and subsequently on Thurrock Local Plan Issues & Options (Stage 2) (December 2018) between 12 December 2018 and 8 March 2019.
- 3.3.79 According to the draft Local Development Scheme ('LDS') (July 2018) presented to the Thurrock Council Planning, Transport, Regeneration Overview and Scrutiny Committee on 4 July 2018, the emerging new Local Plan will be subject of another round of public consultation in the second half of 2019 with further public consultation on the 'Proposed Submission Draft Local Plan' envisaged towards the end of 2020 and an Examination in Public to be held in the first half of 2021.
- 3.3.80 The Local Plan Issues & Options (Stage 2) identifies in Section 3 draft key issues and challenges that the Local Plan will need to address; these include "*Securing sustainable economic growth*", "*Meeting the land and property needs of the business community and Thurrock's major employers*", "*Delivering the strategic and local infrastructure improvements required to support growth and the regeneration of existing communities*", "*Preparing for any impacts of climate change*", "*improving air quality*", and "*Managing water quality and flood risk*". These are then developed into a set of draft strategic objectives which include "*support the Borough's economic success*", "*Reduce the Borough's carbon footprint*", "*Promote, conserve and enhance the special character and heritage of Thurrock*", and "*Ensure new development is well designed and future-proofed to meet changing economic, social, technological and environmental needs*".
- 3.3.81 Section 3 sets out 11 'Policy Principles' to be developed in the next stage of the draft Local Plan preparation. These include:
- '1. Delivering the right infrastructure, in the right place and at the right time' which refers to needing to ensure that the delivery of new infrastructure meets the needs of the local community and business;
 - '5. Minimising Carbon Emissions' which states that: "*Policies will seek to minimise carbon dioxide emissions from new development – with the aspiration of being as carbon neutral as possible – and contribute to the longer term target to reduce emissions and ensure that developments are protected from the impacts of climate change. Development should minimise the need to travel and encourage accessible neighbourhoods using public transport, cycling and walking as a real alternative to car use*";
 - '8. Meeting Employment Needs' which states that: "*Policies will need to recognise the aspirations of the major businesses in the Borough to develop and expand while also ensuring that development occurs in the right locations to protect and enhance the attractiveness of the Borough and make the best use of both existing and planned investment in new infrastructure*".

- 3.3.82 *Section 5 considers issues related to the level of growth and employment land needed in the Borough. It notes that: "There is a significant oversupply of employment land in the Borough relative to future projected demand generated in Thurrock. However, much of this capacity is tied up in strategic land holdings at London Gateway, Thames Enterprise Park and Port of Tilbury related to ports and logistic development". It also notes that: "With the potential for significant employment generation at London Gateway and Thames Enterprise Park, there is also a need to deliver major improvements to their accessibility, particularly by public transport, and to ensure there is sufficient capacity for additional freight movements by rail". In concluding the identification of key growth and employment issues, it states that: "Thurrock has experienced a prolonged and steady increase in jobs and this is forecast to continue into the future through the expansion of existing businesses and development of new ones. Land will be required to meet these business development needs".*

4. REQUIRED CONTENT OF AN EIA REPORT / EIA METHODOLOGY USED IN THIS 2019 ES FID

4.1 Overview

4.1.1 When considering the information to accompany a Variation Application, the Variation Guidance states (at paragraph 36) that: *"Before an application [...] is granted by the Secretary of State or MMO, both the decision maker and the applicant must have complied with the relevant requirements of the [EIA Regulations] regarding environmental assessment"*.

4.2 Required Content of an EIA Report / Further Environmental Information: The Electricity Works (Environmental Impact Assessment) Regulations 2017

4.2.1 When submitting an application for a consent under Section 36 of the Electricity Act 1989, or an application to vary a consent under Section 36C of the Electricity Act 1989, for EIA Development, Regulation 6 of the EIA Regulations requires that: *"Where an application is made for a Section 36 [...] Consent, or a Section 36 Variation, for EIA Development, the relevant authority must not grant the application unless an environmental impact assessment has been undertaken in respect of the development"*.

4.2.2 Regulation 5(1)(a) of the EIA Regulations defines 'EIA Development' as including development of a description set out in Schedule 1. Schedule 1 of the EIA Regulations provides that 'EIA Development' includes: *"a thermal generating station with a heat output of 300 megawatts or more"*. GEC exceeds this threshold.

4.2.3 Regulation 7(1) of the EIA Regulations provides that the EIA process includes the preparation, by the developer, of an EIA Report (in accordance with Regulation 17) and the provision, by the developer to the relevant authority, of the EIA Report and any further environmental information.

4.2.4 Regulation 17(1) and Schedule 4 of the EIA Regulations set out the required content of an EIA Report and any further environmental information. This 2019 ES FID in combination with the February 2010 ES, December 2010 ES FID, August 2014 ES FID and the February 2016 ES FID comprise the EIA Report and further environmental information for the Proposed Development (being the generating station GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as requested in the 2019 Variation Application).

4.2.5 Accordingly, this 2019 ES FID in combination with the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID provide:

- A description of the reasonable alternatives studied by GECL that are relevant to the Proposed Development (being the generating station which GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as per the 2019 Variation Application) and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment;
- A description of the parameters of the Proposed Development;
- A description of the relevant aspects of the current state of the environment (baseline scenario);
- A description of the likely significant effects of the Proposed Development on the environment;
- In the case of this 2019 ES FID, the August 2014 ES FID and the February 2016 ES FID, a description of the main respects in which the likely significant effects of the Proposed Development will differ from those previously described; and,
- A description of the features of the Proposed Development, and any measures envisaged, in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.

4.3 EIA Methodology used in this 2019 ES FID

4.3.1 In order provide the required content of an EIA Report and further environmental information (and comply with the requirements of Regulation 17(1) and Schedule 4 of the EIA Regulations), the EIA methodology used in this 2019 ES FID comprises:

- Discussion with consultees on the key issues to be considered;
- Identification of reasonable alternatives;
- Establishment of the parameters of the Proposed Development;
- Establishment of the relevant aspects of the current state of the environment (baseline scenario);
- Establishment of the likely significant effects of the Proposed Development on the environment;
- Determination of the main respects in which the likely significant effects of the Proposed Development on the environment will differ from those previously described; and,
- Establishment of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on the environment.

4.3.2 A brief description of the EIA methodology used in this 2019 ES FID is provided in this sub-section.

Discussion on the Key Issues to be Considered

4.3.3 In order to be clear about the views of stakeholders, GECL undertook pre-application consultation with a variety of stakeholders who were consulted as part of the Original Application, the 2014 Variation Application and the 2016 Variation Application.

4.3.4 Section 5 (Stakeholder Consultation) provides further information on the pre-application consultation.

Identification of Reasonable Alternatives

4.3.5 The EIA Regulations require (at Regulation 17(1)(d) and Schedule 4(2)) a description of the reasonable alternatives that 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 Proposed Development on the environment.

4.3.6 Section 6 (Alternatives / The Proposed Development) provides further information on these reasonable alternatives.

Establishment of the Parameters of the Proposed Development

4.3.7 Regulation 2(1) of the Variation Regulations defines the term 'Proposed Development' as meaning:

"The generating station, or extension of a generating station, which the applicant would be authorised to construct under a relevant Section 36 Consent if that consent were varied as requested in a variation application".

4.3.8 The EIA Regulations require (at Regulation 17(1)(a) and Schedule 4(1)) a description of the Proposed Development comprising information on the location, design, size and other relevant features (e.g. construction / operational / decommissioning characteristics).

4.3.9 Section 6 (Alternatives / The Proposed Development) provides further information on the parameters of the Proposed Development.

Establishment of the Relevant Aspects of the Current State of the Environment (Baseline Scenario)

4.3.10 In undertaking an EIA, it is important to identify the current state of the environment (i.e. baseline environmental conditions) at the site being considered. This allows the likely effects of the Proposed Development on the environment to be assessed against the existing baseline conditions and allows for appropriate establishment of features /

measures to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.

4.3.11 Accordingly, the EIA Regulations require (at Schedule 4(3)) a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution of the environment without implementation of the Proposed 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.

4.3.12 Based on a mainly desk-based exercise, within this 2010 ES FID, the individual Impact Assessment Sections 8 to 16 provide a summary and update of the relevant aspects of the current state of the environment (baseline scenario).

Establishment of the Likely Significant Effects of the Proposed Development on the Environment and (for Variation Applications) Determination of the Main Respects in which the Likely Significant Effects of the Proposed Development on the Environment will differ from those Previously Described

4.3.13 The EIA Regulations require (at Regulation 17(1)(b), Schedule 4(4) and Schedule 4(5)) a description of the likely significant effects of the Proposed Development on the environment.

4.3.14 For Variation Applications, the EIA Regulations also require (at Regulation 17(1)(e)) a description of: *"the main respects in which the developer thinks that the likely significant effects on the environment of the Development, as varied, will differ from those set out in:*

(i) any EIA Report or environmental statement prepared in connection with the application for the section 36 consent that is proposed to be varied; and,

(ii) if the section 36 consent has been previously varied by a section 36 variation, any EIA Report or environmental statement prepared in connection with the application for that variation".

4.3.15 The description of the likely significant effects of the Proposed Development must cover the direct effects, indirect / secondary effects, cumulative effects and transboundary effects. Within these categories, the description must also cover: short, medium and long-term effects; permanent and temporary effects; and, positive and negative effects.

4.3.16 Direct effects are changes to the state of the environment arising directly from activities that form part of the Proposed Development. For example, direct effects may include deterioration of water quality in a watercourse due to an effluent discharge. Indirect and secondary effects are those which arise as a result of a direct effect. For example (related to the deterioration of water quality in a watercourse due to an effluent discharge), indirect / secondary effects may include mortality / injury / disturbance of aquatic flora and fauna species. Cumulative effects are those that are either due to an inter-relationship of impacts of different types on a single receptor (i.e. dust and noise considered together) or effects from other planned developments (including ancillary development associated with the Proposed Development), combined with those from the Proposed Development (i.e. traffic).

4.3.17 When establishing the likely significant effects of the Proposed Development on the environment, the EIA Regulations require (at Schedule 4(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 difficulties or lack of knowledge) encountered in compiling the required information and the main uncertainties involved.

4.3.18 As such, generally speaking, to assess the significance of the likely effects of the Proposed Development on the environment, significance criteria have been employed to ensure that likely effects of the Proposed Development on the environment are regarded as significant if they are not within acceptable limits. Significance criteria are important as they inform the determination of the overall acceptability of the Proposed Development. The significance criteria use a combination of the magnitude of change (i.e. the size and duration of the effect) and the value / sensitivity of the receptor.

- 4.3.19 This 2019 ES FID summarises the likely significant effects previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID²⁹.
- 4.3.20 Subsequently, this 2019 ES FID describes the main respects in which the likely significant effects of the Proposed Development (being the generating station which GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as per the 2019 Variation Application) on the environment will differ from those previously described. To provide this description, the EIA methodology used comprises a series of questions³⁰ designed to determine the main respects in which the likely significant effects of the Proposed Development on the environment will differ from those previously described. Where there is identification of a difference, the series of questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.
- 4.3.21 Therefore, this 2019 ES FID, in combination with the February 2010 ES, December 2010 ES FID, August 2014 ES FID and the February 2016 ES FID, establishes the likely significant effects of the Proposed Development on the environment, and this 2019 ES FID determines the main respects in which the likely significant effects of the Proposed Development will differ from those previously described.
- 4.3.22 Within this 2019 ES FID, the individual Impact Assessment Sections 8 to 16 consider the likely significant direct and indirect / secondary effects on the relevant aspects of the environment, and the main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development will differ from those previously described. Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.
- Establishment of the Features of the Proposed Development, and any measures envisaged, in order to Avoid, Prevent or Reduce and, if possible, Offset Likely Significant Adverse Effects on the Environment***
- 4.3.23 The EIA Regulations require (at Regulation 17(1)(c) and Schedule 4(7)) a description of the features of the Proposed Development, and any measures envisaged, in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.
- 4.3.24 Within this 2019 ES FID, Section 6 (Alternatives / The Proposed Development), Section 7 (Construction / Operation / Decommissioning) and Section 18 (Consolidated Summary of Mitigation and Monitoring) summarise the features of the Proposed Development and any measures envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment. Section 18 (Consolidated Summary of Mitigation and Monitoring) draws on the conclusions of this 2019 ES FID, in combination with the conclusions of the February 2010 ES, December 2010 ES FID, August 2014 ES FID and February 2016 ES FID.

4.4 EIA Presentation

- 4.4.1 Each of the individual Impact Assessment Sections within this 2019 ES FID has been broken down into a number of key sub-sections. These comprise:

- ***State of the Environment (Baseline Scenario):***

This sub-Section provides an update on the state of the environment (baseline scenario), and the main respects in which the state of the environment (baseline scenario) differs from that previously described.

²⁹ Together, the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID have established the likely significant effects of the generating station GECL would be authorised to construct under the 2016 Varied Consent (and the 2016 Deemed Planning Permission) on the environment.

³⁰ Adapted from the EIA Screening Checklist provided by the National Planning Practice Guidance (NPPG). Available at: <https://www.gov.uk/government/publications/environmental-impact-assessment-screening-checklist>

- ***Likely Significant Effects Previously Described:***

This sub-Section summarises the likely significant effects which have been previously described.

- ***Main Respects in which the Likely Significant Effects will Differ:***

This sub-Section presents the specific questions designed to determine the main respects in which the likely significant effects of the Proposed Development (being the generating station which GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as per the 2019 Variation Application) on the environment will differ from those previously described.

Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

- ***Need for an Updated Impact Assessment / Summary of Updated Impact Assessment***

This sub-Section summarises the need for any necessary further updated impact assessment, and the associated nature and scope. Within this 2019 ES FID, this sub-Section also provides a summary of any updated impact assessment undertaken.

- ***Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects:***

This sub-Section provides a link to Section 18 (Consolidated Summary of Mitigation and Monitoring) which considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on the environment.

5. STAKEHOLDER CONSULTATIONS

5.1 Stakeholder Consultations

- 5.1.1 In order to be clear about the views of stakeholders, GECL undertook pre-application consultation with a variety of stakeholders who were consulted as part of the Original Application, the 2014 Variation Application and the 2016 Variation Application. These stakeholders included BEIS, the local planning authority (Thurrock Borough Council) and governmental and non-governmental organisations.
- 5.1.2 Table 5.1 provides a summary of the pre-application consultation where replies have been received. Table 5.1 also details the subsequent actions taken and, if necessary, a link to any additional information and / or updated impact assessment.

TABLE 5.1: SUMMARY OF THE PRE-APPLICATION CONSULTATION

<i>Consultee</i>	<i>Heading</i>	<i>Summary of Comments</i>	<i>Action / Link</i>
BEIS	2019 Variation Application	GECL met with BEIS on a number of occasions to discuss the 2019 Variation Application. BEIS noted that BESS technologies are suitable in principle for variation applications, as long as the overall development is not fundamentally different in character or scale to that authorised under any existing Section 36 Consent.	N / A
DP World® London Gateway	2019 Variation Application	As part of the agreement between GECL and DP World® London Gateway, GECL are required to obtain approval before submission of a Variation Application. DP World® London Gateway have had the opportunity to view the Variation Application and associated documents and, in principle, do not foresee any issues.	N / A
Environment Agency	2019 Variation Application: Ground Conditions (Geology and Land Contamination)	The Environment Agency stated that: <i>"the former use of the site as an oil refinery presents a risk of contamination that could be mobilised during construction to pollute controlled waters. [...] We request a Preliminary Risk Assessment (PRA) is undertaken which has identified:</i> <ul style="list-style-type: none"> • <i>All previous uses;</i> • <i>Potential contaminants associated with those uses;</i> • <i>A conceptual model of the site including sources, pathways and receptors; and,</i> • <i>Potentially unacceptable risks arising from contamination of the site.</i> <i>The PRA should be followed up by a scheme of site investigation, risk assessment and remediation where necessary verification".</i>	Condition (45) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme to deal with the risks associated with the contamination of the site has been submitted to and approved in writing by Thurrock Borough Council. The scheme shall include: <ul style="list-style-type: none"> • A Preliminary Risk Assessment; • If required, a Site Investigation Scheme; • If required, a Method Statement for any additional remediation; and, • If required, a Verification Plan. Subsequently, Condition (47) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a Verification Report (detailing any additional remediation) for the site has been submitted to and approved in writing by Thurrock Borough Council. This was discussed with the Environment Agency, noting that these existing Conditions mirror the request for a PRA. It was agreed that the PRA, and any associated requirements, would be carried out during Condition discharge.

Consultee	Heading	Summary of Comments	Action / Link
	2019 Variation Application: Ground Conditions (Geology and Land Contamination)	The Environment Agency stated that: <i>"Piling at the site has the potential to create preferential pathways which may allow contamination to migrate to underlying aquifers. A piling risk assessment will need to be undertaken. This will need to demonstrate that the proposed works will not cause an unacceptable risk to controlled waters"</i> .	In addition to the provisions of Condition (45) and (47), the December 2010 ES FID noted that GECL / InterGen would consult with the Environment Agency at a later stage once the indicative piling design is known. This was discussed with the Environment Agency, noting that a piling risk assessment, and any associated requirements, would be carried out during Condition discharge.
	2019 Variation Application: Water Resources and Flood Risk	Further information relating to flood risk was requested by the Environment Agency. Subsequently, on 1 May 2019, a teleconference was held between the Environment Agency and Ramboll to discuss the flood risk issues on site, available updated data and information (i.e. between the February 2010 FRA and the December 2010 Supplementary FRA) and the considerations for any updated FRA. A scope of works for an updated FRA was subsequently submitted to and agreed with the Environment Agency.	Further information is provided in the 2019 Updated Flood Risk Assessment.
	2019 Variation Application: Carbon Capture Readiness	GECL provided a draft copy of the 2019 Updated CCR Feasibility Study to the Environmental Agency for high-level review. Based on this review, the Environment Agency has states that, in principle, they do not foresee any issues.	N / A
	Environmental Permitting: Flood Risk Activities	The Environment Agency stated that: <i>"the applicant may need an environmental permit for flood risk activities if they want to do work in, under, over or within 8 metres (m) from a fluvial river and from any flood defence structure or culvert or 16 m from a tidal main river and from any flood defence structure of culvert. [...] Application forms and further information can be found at: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits. Anyone carrying out these activities without a permit where one is required, is breaking the law"</i> .	Noted. Should an Environmental Permit for flood risk activities be required, an application will be made in due course. This action was discussed and agreed, noting that early engagement for any application is recommended.

Consultee	Heading	Summary of Comments	Action / Link
	Environmental Permitting: Installations	The Environment Agency stated that: <i>"the site [...] was granted an environmental permit in 2016 for a 1250 MWe Closed Cycle Gas Turbine (CCGT) with up to two 6.5 MWe auxiliary boilers, two heat recovery steam turbines and associated infrastructure. Since permit issue, the applicant is submitted further section 36 applications under the Electricity Act (1989) have been made to include an Open Cycled Gas Turbine (OCGT) and a Battery Energy Storage System (BESS). As a result of these changes a permit variation is required to reflect the new proposed development. Details on how to vary a permit can be found [...] at: https://www.gov.uk/topic/environmental-management/environmental-permits. The applicant is advised to review the requirements of the Large Combustion Plant BRef (BAT Reference Document) and the Medium Combustion Plant Directive, published in 2017 and 2018 respectively"</i> .	During operation, activities on the Proposed Development site will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016. GECL already holds an Environmental Permit for the development permitted by the 2014 Varied Consent (i.e. Development Option (i)) (EPR/EP3536EN) issued in July 2016. Based on the Development Option selected, an application to vary this Environmental Permit will be made in due course, and the Environment Agency would be consulted on the scope and content of such an application. This action was discussed and agreed, noting that early engagement for any application is recommended.
Essex County Council (Historic Environment)	2019 Variation Application	A call was held with the specialist officer from Essex County Council covering historic environment aspects. The call covered the 2019 Variation Application and provided updated information on the likely forthcoming application(s) for the gas and electrical connections.	For the 2019 Variation Application, noting the Original Application, the 2014 Variation Application and the 2016 Variation Application, no further actions were suggested relating to historic environment. For the gas and electrical connections, further consultation will be undertaken as part of the likely forthcoming application(s).
Highway England	2019 Variation Application: Traffic and Transport Infrastructure	GECL representatives met with Highways England to discuss the 2019 Variation Application, and associated traffic and transport infrastructure aspects.	Further information is provided in the 2019 Transport Report Addendum.
Natural England	2019 Variation Application	A call was held with Natural England to covering ecological aspects. The call covered the 2019 Variation Application and provided updated information on the likely forthcoming application(s) for the gas and electrical connections.	For the 2019 Variation Application, noting the Original Application, the 2014 Variation Application and the 2016 Variation Application, no further actions were suggested relating to ecology. For the gas and electrical connections, further consultation will be undertaken as part of the likely forthcoming application(s).
Thurrock Borough Council (as the Local Highways Authority)	2019 Variation Application: Traffic and Transport Infrastructure	GECL representatives met with Thurrock Borough Council (as the Local Highways Authority) to discuss the 2019 Variation Application, and associated traffic and transport infrastructure aspects.	Further information is provided in the 2019 Transport Report Addendum.

GATEWAY ENERGY CENTRE
2019 ENVIRONMENTAL STATEMENT
Further Information Document

<i>Consultee</i>	<i>Heading</i>	<i>Summary of Comments</i>	<i>Action / Link</i>
Thurrock Borough Council (as the Local Planning Authority)	2019 Variation Application	<p>GECL, and their advisors, met with Thurrock Borough Council to discuss the 2019 Variation Application and provide updated information on the likely forthcoming application(s) for the gas and electrical connections.</p> <p>With regards to the content of the 2019 Variation Application, in particular this 2019 ES FID, Thurrock Borough Council provided details for a number of their specialist officers including those covering air quality, noise and vibration, landscape and ecology.</p>	<p>For the 2019 Variation Application, e-mails and calls were held with the specialist offers, and wherever necessary information has been included into the Impact Assessment Sections of this 2019 ES FID.</p> <p>For the gas and electrical connections, further consultation will be undertaken as part of the likely forthcoming application(s).</p>

5.2 Future Consultation

- 5.2.1 Future public / local resident statutory consultation will be undertaken via the advertising of the 2019 Variation Application in national and local press within electronic versions of the associated documents, including the EIA Report and further environmental information for the Proposed Development (this 2019 ES FID, and the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID), being available for download free of charge from the GEC website:
<http://www.intergen.com/development-opportunities-portfolio/gateway-energy-centre-downloads>
- 5.2.2 Furthermore, stakeholder consultation will continue, including stakeholder with whom contact has already been made along with additional groups or individuals who have interest in the Proposed Development.
- 5.2.3 Ongoing and future consultations will continue to be posted on the GEC website.

6. ALTERNATIVES / THE PROPOSED DEVELOPMENT

6.1 Alternatives

6.1.1 The EIA Regulations require (at Regulation 17(1)(d) and Schedule 4(2)) a description of the reasonable alternatives studied by the developer that 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 and including a comparison of the effects on the environment.

6.1.2 In terms of the reasonable alternatives previously described, the February 2010 ES covered:

- Alternative sites;
- Alternative processes / technologies for the generating station;
- Alternative technologies for cooling of the generating station;
- Alternative site layouts; and,
- Alternative infrastructure connections.

6.1.3 Subsequently:

- Supporting the Original Application and the 2014 Variation Application respectively, the December 2010 ES FID and the August 2014 ES FID provided an update of the alternative infrastructure connections (namely that planning permission had been granted for the selected infrastructure connection options); and,
- Supporting the 2016 Variation Application, the February 2016 ES FID provided an update of the alternative processes / technologies for the generating station and alternative site layouts.

6.1.4 Supporting the 2019 Variation Application, this 2019 ES FID provides an update of the reasonable alternatives relevant to the Proposed Development (being the generating station GECL would be authorised to construct if the 2016 Varied Consent (and the 2016 Deemed Planning Permission) is varied as requested in the 2019 Variation Application) covering:

- Alternative processes / technologies for the generating station;
- Alternative site layouts; and,
- Alternative infrastructure connections.

Alternative Processes / Technologies for the Generating Station

6.1.5 The February 2010 ES and the February 2016 ES FID noted that InterGen considered a number of alternative processes / technologies for electricity generation at a strategic level to determine what form of generating station to pursue. The alternative processes / technologies comprised electricity generation from: sustainable fuels (e.g. biomass); renewables (e.g. wind / solar); nuclear fuels; and, fossil fuels. Within this 2019 ES FID, consideration is also given to electricity 'generation' from energy storage projects.

6.1.6 The main considerations influencing the decision-making process were:

- The likely significant effects on the environment;
- The regulatory climate (e.g. the certainty that the generating station will be able to continue to generate for its operational lifetime / the likelihood that the generating station will obtain the necessary consents and permits);
- Technical feasibility;
- Economic feasibility; and,
- InterGen experience and expertise.

Sustainable Fuels

- 6.1.7 Electricity generation from sustainable fuels covers a diverse range of fuels, including those derived from: timber; fuels crops; and, agriculture or food wastes.
- 6.1.8 Specifically in terms of effects on the environment, electricity generation from sustainable fuels:
- Generates a range of different air emissions depending upon the specific fuel and technology used;
 - Requires large areas of land for fuel storage and a reliable fuel source; and,
 - Requires regular delivery of fuels.
- 6.1.9 Therefore, in agreement with the February 2010 ES and February 2016 ES FID, electricity generation from sustainable fuels is not considered feasible at the Proposed Development site.

Renewables

- 6.1.10 In terms of effects on the environment, electricity generation from renewables (e.g. solar PV and wind):
- Requires large areas of land.
- 6.1.11 Therefore, in agreement with the February 2010 ES and February 2016 ES FID, electricity generating from renewables is not considered feasible at the Proposed Development site.
- 6.1.12 InterGen supports renewables and believes electricity generation from renewables has an important role to play in the energy mix as the UK makes the transition to a low carbon economy. Whilst InterGen continues to consider investment in renewables, it has not yet identified a suitable opportunity in the UK.

Nuclear

- 6.1.13 Electricity generation from nuclear fuels would require that the Proposed Development site was considered by the UK Government as a potential site for a new nuclear generating station. The list of potential sites is included in the technology specific 'National Policy Statement for Nuclear Power Generation (EN-6): (Volume I of II)'³¹ (EN-6).
- 6.1.14 EN-6 states (at paragraph 4.4.1) that: *"the following sites are those that the Government has determined are potentially suitable for the deployment of new nuclear power stations in England and Wales before the end of 2025:*
- *Bradwell;*
 - *Hartlepool;*
 - *Heysham;*
 - *Hinkley Point;*
 - *Oldbury;*
 - *Sizewell;*
 - *Sellafield; and*
 - *Wyfla".*
- 6.1.15 As the Proposed Development site has not been identified as a potential site for a new nuclear generating station, in agreement with the February 2010 ES and the February 2016 ES FID, electricity generation from nuclear fuels it is not currently considered feasible, or appropriate, at the Proposed Development site.

³¹ Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47859/2009-nps-for-nuclear-volume1.pdf

Fossil Fuels

- 6.1.16 Electricity generation from fossil fuels covers a range of fuels including: coal; oil; and, natural gas. However, there are environmental concerns associated with burning fossil fuels, particularly with regard to their contribution to global warming through carbon dioxide (CO₂) emissions. The severity of environmental impacts associated with electricity generation from fossil fuels is dependent on the type of fossil fuel burnt and the specific plant technology.
- 6.1.17 Specifically in terms of effects on the environment, electricity generation from coal and oil:
- Typically generates more air emissions per MW of electricity generated than electricity generation from natural gas;
 - Requires regular delivery of fuels; and,
 - Requires regular waste / residue removal.
- 6.1.18 Therefore, in agreement with the February 2010 ES and the February 2016 ES FID, electricity generation from coal and oil is not considered appropriate at the Proposed Development site.
- 6.1.19 Electricity generation from natural gas is the preferred process at the Proposed Development site. In this regard, there are a number of alternative technologies available including: CCGT units; OCGT units; and, reciprocating gas engines.
- 6.1.20 Specifically in terms of environmental effects, due to the method in which fuel is combusted in reciprocating gas engines, there is typically a requirement for additional NO_x abatement (e.g. Selective Catalytic Reduction). This would impose a larger footprint, and may also require additional chemicals (ammonia / urea) to operate. These chemicals have the potential to lead to greater environmental effects (e.g. disposal of catalysts / ammonia slip).
- 6.1.21 Therefore, in agreement with the February 2010 ES and the February 2016 ES FID, electricity generation using reciprocating gas engines is not considered appropriate at the Proposed Development site.

Energy Storage Systems

- 6.1.22 Energy storage systems are classified according to the form of energy they use, and include: mechanical; electrochemical (battery); chemical; thermal; and, electromagnetic. For the majority of these, the technology is either not fully developed, not currently commercially viable, or not appropriate at the Proposed Development site.
- 6.1.23 The most developed, commercially viable and appropriate technology is an electrochemical (battery) energy storage system.

Preferred Process and Technology

- 6.1.24 In terms of the preferred process and associated preferred technology, electricity generation from natural gas is the preferred process and the preferred technology comprises the use of (under Development Option (i)) CCGT unit(s) or (under Development Option (ii)) a CCGT unit and OCGT unit(s). Complimenting this electricity generation, the 2019 Variation Application seeks include, in Development Option (ii), a BESS with a rated electrical output of up to 320 MW (alongside the CCGT unit and the OCGT unit(s)).
- 6.1.25 Electricity generation from natural gas and the preferred technology (CCGT unit(s) or a CCGT unit and OCGT unit(s)) is the preferred process and technology on the basis that:
- Natural gas is a secure fuel supply and the National Grid National Gas Transmission network gas supply pipeline west of the Proposed Development site is accessible and has capacity;
 - Electricity generation from natural gas requires smaller land take / structures than many other forms of electricity generation;

- Electricity generation from natural gas typically results in lower air emissions (e.g. CO₂, NO_x, particulate matter and SO₂) compared to alternative fossil fuels;
- Electricity generation from natural gas does not produce material amounts of solid waste which are typical of many other forms of electricity generation;
- Both CCGT units and OCGT units are reliable and flexible; and,
- Both CCGT units and OCGT units are relatively low cost to construct and operate.

6.1.26 Complimenting this electricity generating, under Development Option (ii), electricity 'generation' from an electrochemical (battery) energy storage system is preferred technology and although the battery types may be varied throughout the lifetime of the BESS, it is currently envisaged that lithium-ion batteries will be used during the initial operational phase³². This process and technology is fully developed, proven, commercially viable and appropriate at the Proposed Development site.

Alternative Layouts Considered

6.1.27 The Construction Contractor(s) who will complete the final layout and design of the Proposed Development will not be appointed until after the 2019 Variation Application. Therefore it is not until this time that the final precise layouts and designs of the Proposed Development will be completed.

6.1.28 For this reason, it is not possible to provide the precise final layouts and designs for the Proposed Development. However, preliminary engineering studies have been undertaken to develop parameter layouts which have formed the basis for the assessment of likely significant effects of the Proposed Development on the environment.

Alternative Infrastructure Connections

Gas Connection

6.1.29 Both Development Option (i) and Development Option (ii) include the construction of a CCGT unit(s). Development Option (ii) additionally includes the construction of an OCGT unit(s). During operation, both the CCGT unit(s) and OCGT unit(s) will burn natural gas only, which will be required to be supplied to the GEC site via an underground gas pipeline.

6.1.30 The February 2010 ES and the December 2010 ES FID presented the various alternative gas connection route options that had been considered and how these would be further considered prior to making a separate application for authorisation. Due to the available capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station, the February 2010 noted the need for a new connection.

6.1.31 Subsequently, the August 2014 ES FID stated that on 8 March 2012, planning permission (Reference: 11/50286/TTGFUL) was granted to GECL by TTGDC to: "*develop an underground gas pipeline, an above ground installation (AGI) and ancillary development (including pipeline route markers, cathodic protection posts, M4 marker posts (for special crossings) and landscaping / biodiversity provision)*". The August 2014 ES FID also described the route of this approximately 8 km long underground gas pipeline from a new AGI, next to the existing AGI, on the National Grid Gas National Transmission System Number 5 Feeder Pipeline near Butts Lane, paralleling the route of the existing pipeline for the majority of its length to a point north of the GEC site, before turning south towards the GEC site.

6.1.32 Following discharge of the relevant conditions, this planning permission was implemented on 7 March 2017 by the construction of a new access road to the associated AGI. The implementation was in accordance with approved drawings and documents, thereby the planning permission is preserved in perpetuity.

6.1.33 Under both Development Options, this approximately 8 km long underground gas pipeline is required for the CCGT unit(s) as there is not sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station.

³² Regarding other battery types, it is understood that lithium-ion batteries will continue to be the battery chemistry of choice for the foreseeable future, largely due to the upfront investment in this battery chemistry from the automotive industry in large-scale manufacturing capacity for the electric vehicle market.

- 6.1.34 However, under Development Option (ii), should there be phasing of GEC with the OCGT unit(s) constructed and operated in advance of the CCGT unit, there is sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station for the OCGT unit(s). As it is technical feasible to 'tap-in' to the existing underground gas pipeline, under Development Option (ii), a phase with only OCGT unit(s) would be more cost-competitive in comparison to a phase which also includes the CCGT unit, as the OCGT unit(s) would not be financially overburdened by the cost of the 8 km long underground gas pipeline for the CCGT unit. This would allow the OCGT unit(s) to participate as a separate Capacity Market Unit within the Capacity Market Auction, thereby maximising the potential to successfully secure a Capacity Market Award.
- 6.1.35 Therefore, GECL are currently investigating the potential for a shorter length of underground gas pipeline based on a 'tap-in' to the existing underground gas pipeline serving the existing Coryton CCGT generating station. As part of this 'tap-in', a smaller AGI would also be required. In progressing this investigation, GECL has commissioned some initial gas feasibility work to identify possible new route options and AGI locations. It is currently anticipated that the initial gas feasibility work will be further developed into an application for the shorter length of underground gas pipeline and smaller AGI, most likely an application for planning permission under the Town and Country Planning Act 1990.

Electrical Connection

- 6.1.36 For both Development Options, during operation, the electricity generated will be dispatched to the National Grid Electricity National Transmission System via a new HV electrical connection from the GEC site into the existing Coryton South Substation.
- 6.1.37 The February 2010 ES and the December 2010 ES FID presented the various alternative electrical connection route options that had been considered and how these would be further considered prior to making a separate application for authorisation.
- Subsequently, the August 2014 ES FID stated that on 27 February 2013, planning permission (12/01085/FUL) was granted to GECL by Thurrock Borough Council: *"for the development of a high voltage electrical connection comprising an underground and possible part culverted double circuit 400 kV cable system linking the approved Gateway Energy Centre electrical switchyard/s to the existing National Grid Coryton South Substation, together with an extension to the substation, installation of electrical equipment (including a 400 kV rotating centre post disconnecter, 400 kV surge arrestors, 400 kV air insulated switchgears / gas insulated switchgear buildings, 400 kV gas insulated switchgear circuit breaker, 400 kV gas insulated switchgear cable sealing ends), associated development (including transitional bay, marker posts / plates) and access track works"*.
- 6.1.38 However, this development was not commenced, and the planning permission has since expired. Accordingly, GECL has commissioned some initial electrical feasibility work to identify possible new route options for the HV electrical connection and it is currently anticipated that the initial electricity feasibility work will be developed into an application for the new HV electrical connection, most likely an application for a replacement planning permission under the Town and Country Planning Act 1990.

6.2 The Proposed Development

The 2019 Variation Application

- 6.2.1 Under the 2016 Varied Consent:
- Condition 2 provides that: *"the Development shall be up to 1250 MW capacity and comprise:*
 - (a) *Either;*
 - (i) *up to two Combined Cycle Gas Turbine (CCGT) units (including for each CCGT unit: a gas turbine; a heat recovery steam generator; steam turbine plant; and, associated equipment); or,*

- (ii) (1) one CCGT unit (including: a gas turbine; a heat recovery steam generator; steam turbine plant; and, associated equipment), and
(2) one or more Open Cycle Gas Turbine (OCGT) units with the OCGT units having a combined rated electrical output of less than 300 MW³³ (including for each OCGT unit: a gas turbine; and, associated equipment).
- (d) air cooled condensers and auxiliary cooling;
- (e) gas receiving facility;
- (f) one or more electrical switchyards;
- (g) ancillary plant and equipment; and,
- (h) the necessary buildings (including administration offices) and civil engineering works”;
- Condition 4(1A) provides that: “the Company shall notify the Secretary of State and Thurrock Council (as the relevant planning authority) which one of the gas turbine technology options in paragraph 2(a) of this consent has been selected prior to the commencement of the Development and provide details of the capacity of each gas turbine technology to be used”; and,
- Condition 4(2) provides that: “the commencement of the Development shall not be later than five years from 3 August 2016”³⁴.

6.2.2 Based on a number of influencing factors, GECL is submitting the 2019 Variation Application. The 2019 Variation Application seeks to:

- Provide that GEC shall remain up to 1250 MW, but shall comprise either (*green italic text added to highlight proposed variation*):
 - (i) *Development Option (i)*, comprising:
Up to two CCGT units (including for each CCGT unit: a gas turbine; a HRSG; steam turbine plant; and, associated equipment); or,
 - (ii) *Development Option (ii)*, comprising:
 - (1) One CCGT unit with a rated electrical output of up to 630 MW (including: a gas turbine, HRSG; steam turbine plant; and, associated equipment);
 - (2) One or more OCGT units, with the OCGT units having a combined rated electrical output of less than 300 MW (including for each OCGT unit: a gas turbine; and, associated equipment); and,
 - (3) *A Battery Energy Storage System (BESS) with a rated electrical output of up to 320 MW (including: batteries; associated enclosures; control and protection systems; temperature control systems; and, power conversion systems).*
- Provide that the commencement of GEC shall take place not later than 31 December 2023.
- Better allow for a phased development of GEC by varying conditions and including a new condition to specify and require, where relevant, that:
 - Certain conditions only apply to a specific phase of the Proposed Development, and not to other phases;
 - A scheme for the phasing of the works comprised in the Proposed Development be submitted and approved; and,
 - Under certain conditions, the approval of details may be applied for and granted on a phase-by-phase basis.

³³ 300 MW refers to the OCGT(s) and not the CCGT and the OCGT(s).

³⁴ Similarly, Condition 3 (Time Limits) of the 2016 Deemed Planning Permission provides that: “the commencement of the Development shall take place before the expiry of five years from 3 August 2016”.

- With regards to CCR and designated sites, provide that:
 - 'CCS site for Development Option (i)' and 'CCS site for Development Option (ii)' mean the areas of land hatched green on FIGURE 1620002349-018-00004 (P02) and FIGURE 1620002349-018-00005 (P02) respectively allocated to the Development Options; and,
 - 'designated site' means, following notification to the Secretary of State and Thurrock Borough Council which one of the Development Options has been selected, the area of land allocated to that Development Option as the area where GECL proposes to locate the capture equipment.

The Proposed Development: Gateway Energy Centre

6.2.3 Regulation 2(1) of the Variation Regulations defines the term 'Proposed Development' as meaning: "*The generating station, or extension of a generating station, which the applicant would be authorised to construct under a relevant Section 36 Consent if that consent were varied as requested by the variation application*".

6.2.4 Accordingly, this Section provides a description of the Proposed Development (i.e. GEC, being the generating station GECL would be authorised to construct if the 2016 Varied Consent is varied as requested in the 2019 Variation Application), comprising information on its location, design, size and other relevant features. Section 7 (Construction / Operation / Decommissioning) provides additional information on the construction, operational and decommissioning characteristics of the Proposed Development.

6.2.5 Wherever appropriate, the parameters presented in this Section provide an 'envelope' for assessing the likely effects of the Proposed Development on the environment. Accordingly, in order to ensure that the likely significant effects of the Proposed Development on the environment are described and assessed, parameters have been set which are broad enough to take account of all reasonable options available for the Proposed Development. Such an approach is considered good practice, as reflected in case law as the 'Rochdale Envelope' principle. Suitably applied within EIA methodology, it can ensure there is a comprehensive assessment of the likely significant effects of a Proposed Development on the environment.

[Indicative Programme / Phasing](#)

6.2.6 Regarding phasing:

- Condition 2 of the 2016 Varied Consent does not require that the Proposed Development is constructed in a single phase;
- Condition (8)(vii) of the 2016 Deemed Planning Permission contemplates that the works may be phased; but
- The Original Application, the 2014 Variation Application and the 2016 Variation Application assessed the likely significant effects of the Proposed Development on the environment on the assumption that construction was in a single phase.

6.2.7 The 2019 Variation Application seeks to better allow for a phased development of GEC in recognition that a generating station represents a complex project where longer commencement deadlines, with phasing of works, can be justified. Accordingly, in order to better allow for a phased development of GEC, the 2019 Variation Application seeks to, under the 2016 Deemed Planning:

- Vary a number of existing certain conditions to only apply to a specific phase of the Proposed Development, and not to other phases;
- Include a new condition (Condition (3A)) to require that commencement of the Proposed Development not take place until a scheme for the phasing of the works comprised in the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council; and,
- Vary a number of the existing certain conditions to require that the approval of details may be applied for and granted on a phase-by-phase basis, with commencement of a specified phase of the Proposed Development not taking phase

until the details associated with the specified phase being submitted and approved in writing by Thurrock Borough Council.

- 6.2.8 Therefore, the 'phasing envelope' for assessing the likely significant effects of the Proposed Development on the environment comprises:
- Construction and operation of the Proposed Development in one phase, for example:
 - For Development Option (i), construction of two CCGT units; or,
 - For Development Option (ii), construction of one CCGT unit along with the OCGT unit(s) along with the BESS.
 - Construction and operation of the Proposed Development over a number of phases, for example:
 - For Development Option (ii), likely including:
 - o A 'CCGT Unit Phase': construction of the CCGT unit;
 - o An 'OCGT Unit(s) Phase': construction of the OCGT unit(s); and,
 - o A 'BESS Phase': construction of the BESS.
- For Development Option (ii), it should also be noted that some of these sub-phases may also be phased, for example construction of part of the BESS followed by construction of the remaining part of the BESS.

- 6.2.9 In the event that the construction and operation of the Proposed Development occurs over a number of phases, this will ultimately be determined by external influencing factors including developments and changes in the energy market, in particular the UK Government's Capacity Market. Indeed, as noted previously, the rationale for phased development is to maximise the potential for GEC to secure a 15-year contract(s) in future Capacity Market Auctions and, in recognition of their differing economics, be able to participate as separate Capacity Market Units within the Capacity Market Auction, thereby maximising the potential to successfully secure a 15-year Capacity Market Award, and consequently secure financing of the relevant project(s).

Proposed Development Location

- 6.2.10 The Proposed Development will be located within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent).
- 6.2.11 The Ordnance Survey (OS) Grid Reference of the centre of the Proposed Development site is approximately 573209, 182165.
- 6.2.12 The overall red-line boundary covers a total area of approximately 29.1 hectares (ha) (71.9 acres). This includes:
- The GEC site, which covers an area of approximately 11.3 ha (27.9 acres) and includes the land to be set aside for the purposes of CCR; and,
 - Land to the north and west which is intended to be used during construction for temporary laydown and storage.
- 6.2.13 The overall red-line boundary, and the GEC site, is located on the north bank of the Thames Estuary on land within the DP World® London Gateway Logistics Park, to the north of the DP World® London Gateway Port

State of the Environment

- 6.2.14 The GEC site is located on land within the DP World® London Gateway Logistics Park.
- 6.2.15 As part of the agreement between GECL and the team behind the DP World® London Gateway Logistics Park, the GEC site will be cleared, remediated and levelled, and provided in a condition that would allow for the construction of GEC. The likely significant effects of the clearance, remediation and levelling works have previously been assessed as part of the historical applications for the DP World® London Gateway sites.

- 6.2.16 As such, the current state of the environment (i.e. assumed baseline scenario) at the GEC site comprises a cleared, remediated and levelled site post-works undertaken for the DP World® London Gateway Logistics Park.
- 6.2.17 Clearance, remediation and levelling works have commenced within the DP World® London Gateway Logistics Park, and a substantial part of the DP World® London Gateway Logistics Park has been successfully cleared, remediated and levelled³⁵.
- 6.2.18 At the time of writing this 2019 ES FID, it is noted that construction and build-out of the DP World® London Gateway sites continues, with approximately 113099 m² of Logistics Park 'B'-Class floor space and three Port berths currently operational. A further 41575 m² of Logistics Park 'B'-Class floor space and remaining three Port berths remain authorised, and will be delivered subject to commercial demand. Additional clearance, levelling and remediation continues in a manner to support this on-going development.
- 6.2.19 As noted in the August 2014 ES FID, it is also understood from DP World® that, within the Logistics Park and Port, development of an individual plot would only commence once it had been successfully cleared and remediated.

[Site Surroundings](#)

- 6.2.20 The Proposed Development site is located on the north bank of the Thames Estuary, approximately 6 km east of the A13. The A1014 dual carriageway (The Manorway) lies approximately 0.5 km to the north of the site and runs east to west to provide a link with the A13, which in turn connects with the M25 at Junction 30.
- 6.2.21 Within the immediate surrounding area, the predominant land use is industrial, with some residential settlements located further afield. In brief, the immediate surrounding land uses comprise:
- To the north, the A1014 dual carriageway (The Manorway);
 - To the east, the Shell Haven Terminal (approximately 100 m), the Coryton CCGT generating station (approximately 700 m) and the former Petroplus Coryton Oil Refinery site³⁶ (approximately 950 m);
 - To the south, the DP World® London Gateway Port and the Thames Estuary; and,
 - To the west, the DP World® London Gateway Logistics Park.
- 6.2.22 Therefore, the Proposed Development site will be viewed within the context of the immediate surrounding area, where the predominant land use is industrial.
- 6.2.23 The nearest residential settlements are:
- To the north, Basildon (approximately 7 km);
 - To the east, Canvey Island (approximately 5 km); and,
 - To the west, Corringham and Fobbing (approximately 4 km).
- 6.2.24 Within the wider surrounding rural area, the predominant land use is agricultural.

[Summary](#)

- 6.2.25 Condition (2) of the 2016 Deemed Planning Permission requires the Proposed Development to be located within the overall red-line boundary. The 2019 Variation Application does not seek to vary this Condition. As such, there will be no change to the Proposed Development location (i.e. the overall red-line boundary) and, as such, the future land uses of the Proposed Development site comprise those relating to energy / electricity generation.

[Design of the Proposed Development](#)

- 6.2.26 The Construction Contractor(s) who will complete the final layout and design of the Proposed Development will not be appointed until after the 2019 Variation Application.

³⁵ At the time of writing the August 2014 ES FID, it was noted that approximately 80% of the locations across the DP World® London Gateway Logistics Park site which were known to require remediation had been remediated.

³⁶ The former Petroplus Coryton Oil Refinery ceased production in June 2012. Following its sale, the site is being used for new developments, including the Thames Enterprise Park.

Therefore, it is not until this time that the final precise layouts and designs of the Proposed Development will be completed.

- 6.2.27 For this reason, it is not possible to provide the precise final layouts and designs for the Proposed Development. However, preliminary engineering studies have been undertaken to establish the parameters of the Proposed Development. These parameters have formed the basis for the establishment of the likely significant effects of the Proposed Development on the environment.
- 6.2.28 Condition (8) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme of provisions for the layout and design has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme of provisions for the layout and design associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
- 6.2.29 The design of equipment / buildings / enclosures will minimise regular and long-term maintenance requirements. Materials and finishes will be selected to meet this objective and to ensure that the appearance of the Proposed Development does not deteriorate materially over its operating lifetime (approximately 35 years). Materials and finishes will be similar to those used on existing generating stations, and will be selected to align with the appearance of the surrounding land uses, including the DP World® London Gateway Logistics Park.
- 6.2.30 Condition (9) of the 2016 Deemed Planning Permission requires the Proposed Development to adhere to the design principles within the December 2010 Revised Design and Access Statement. Whilst there will be no change to these overarching design principles, the 2019 Variation Application seeks to vary this Condition to require that each phase of the Proposed Development adhere to these design principles.
- 6.2.31 For safety and security, a perimeter security fence will be installed around the Proposed Development site. Motion sensor CCTV cameras will also be installed.

Landscaping

- 6.2.32 An overall landscaping strategy will be developed which aims to enhance the ecological resource of the Proposed Development site, and maintain connectivity to ecological resources in the wider area.
- 6.2.33 Condition (50) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme of landscaping (in accordance with the February 2010 ES) has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme of landscaping associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

Size of the Proposed Development

Dimensions

- 6.2.34 The February 2010 ES included a Parameter Block Model Layout³⁷. Insert 6.1 provides the Parameter Block Model Layout. The December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID subsequently referenced this Parameter Block Model Layout.
- 6.2.35 Within the February 2010 ES (and the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID), the basis for the assessment of likely significant effects of the Proposed Development on the environment is that the Proposed Development is located wholly within the limits of the Parameter Block Model Layout. This provided an

³⁷ Included in: 'Environmental Statement Volume 3 (Figures)' (Parsons Brinckerhoff, February 2010). Figure 4.3 'Proposed Indicative Layout / Parameter Block Model Layout'.

'envelope' for assessing the likely effects of the Proposed Development on the environment.

- 6.2.36 For the Parameter Block Model Layout, Table 6.2 identifies the plant / equipment expected to be located within the various areas.

INSERT 6.1: PARAMETER BLOCK MODEL LAYOUT

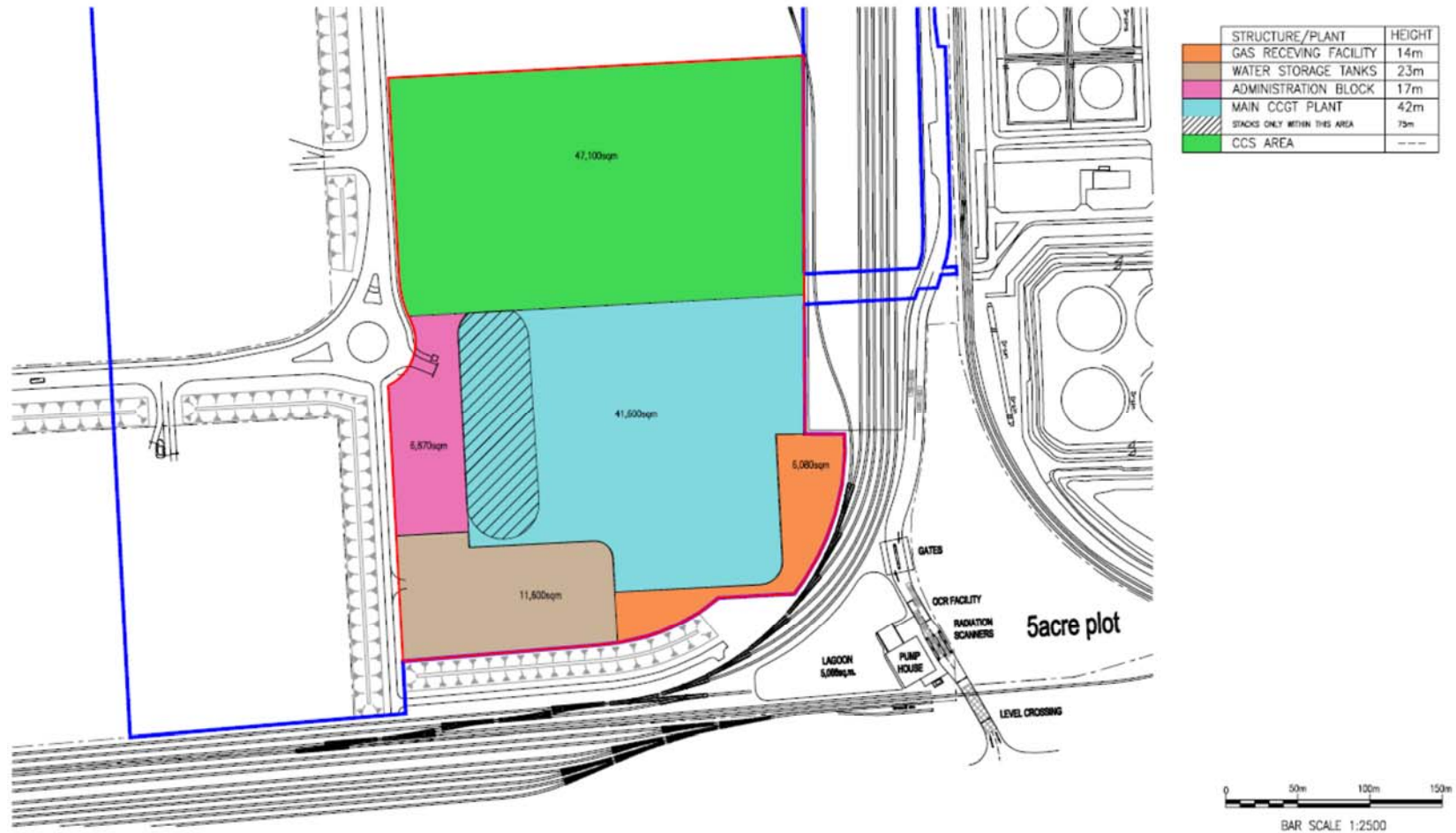


TABLE 6.2: PLANT / EQUIPMENT EXPECTED TO BE LOCATED WITHIN THE VARIOUS PARAMETER BLOCK MODEL LAYOUT AREAS

Area	Maximum Height (m)	Approx. Area* (m²)	Previously Described in February 2010 ES	Development Option (i)	Development Option (ii)
Blue	42	41,600	<p>Main plant / equipment area, including:</p> <ul style="list-style-type: none"> • For the CCGT unit(s): <ul style="list-style-type: none"> - Air inlets; gas turbines; HRSGs; steam turbines; ACC; fin-fan coolers; transformers; and, other associated equipment. 	<p>Main plant / equipment area, including:</p> <ul style="list-style-type: none"> • For the CCGT unit(s): <ul style="list-style-type: none"> - Air inlets; gas turbines; HRSGs; steam turbines; ACC; fin-fan coolers; transformers; and, other associated equipment. 	<p>Main plant / equipment area, including:</p> <ul style="list-style-type: none"> • For the CCGT unit: <ul style="list-style-type: none"> - Air inlet; gas turbine; HRSG; steam turbine; ACC; fin-fan coolers; transformers; and, other associated equipment. • For the OCGT unit(s): <ul style="list-style-type: none"> - Air inlet(s); gas turbine(s); stack(s); fin-fan coolers; transformers; and, other associated equipment. • For the BESS: <ul style="list-style-type: none"> - BESS enclosures; and, other associated equipment. <p>Would include some of the proposed 'CCS Site for Development Option (ii)'.</p>
Blue Hatch	75	Within the Blue Area	<p>Including:</p> <ul style="list-style-type: none"> • For the CCGT unit(s): <ul style="list-style-type: none"> - Stacks. 	<p>Including:</p> <ul style="list-style-type: none"> • For the CCGT unit(s): <ul style="list-style-type: none"> - Stacks. 	<p>Including:</p> <ul style="list-style-type: none"> • For the CCGT unit: <ul style="list-style-type: none"> - Stack.

Area	Maximum Height (m)	Approx. Area* (m²)	Previously Described in February 2010 ES	Development Option (i)	Development Option (ii)
Pink	17	6,870	Administration area, including: <ul style="list-style-type: none"> • Administration and control building; • Warehouse and maintenance building; and, • Car parking. 	Administration area, including: <ul style="list-style-type: none"> • Administration and control building; • Warehouse and maintenance building; and, • Car parking. 	Administration and water treatment area, including: <ul style="list-style-type: none"> • For administration: <ul style="list-style-type: none"> - Administration and control building; - Warehouse and maintenance building; and, - Car parking. • For water treatment: <ul style="list-style-type: none"> - Water treatment plant; - Demineralised water storage tank; and, - Firewater storage tank.
Brown	23	11,600	Water treatment area, including: <ul style="list-style-type: none"> • Water treatment plant; • Demineralised water storage tank; and, • Firewater storage tank. 	Rainwater retention area.	Would include some of the proposed 'CCS Site for Development Option (ii)'.
Orange	14	6,080	Gas reception area.	Gas reception area.	Would include some of the proposed 'CCS Site for Development Option (ii)'.
Green	N / A	47,100	Covers the 'CCS Site for Development Option (i)'.	Covers the 'CCS Site for Development Option (i)'.	N / A. Would not be required for Development Option (ii).

- 6.2.37 In terms of the main respects in which the plant / equipment items expected to be located within the various area differ from those previously described, whilst there may be some additional structures and some re-location of items of plant / equipment, both Development Option (i) and Development Option (ii) remain wholly located within the limits of the original Parameter Block Model Layout.
- 6.2.38 Condition (8) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme of provisions for the layout and design has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme of provisions for the layout and design associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

Further Variations to the Phasing, Location, Design and / or Size of the Proposed Development

- 6.2.39 Should further variations to the phasing, location, design and / or size of the Proposed Development be required, consideration will be given to the provisions of Condition (60) and Condition (61) of the 2016 Deemed Planning Permission.
- 6.2.40 Condition (60) of the 2016 Deemed Planning Permission requires that: *"where the words 'unless otherwise agreed in writing by the Council' or 'with the prior written approval of the Council' or similar appear, such agreement or approval may only be given in relation to immaterial changes where is has been demonstrated to the satisfaction of [Thurrock Borough Council] that the agreement or approval is unlikely to give rise to any materially new or materially different environmental effects from those assessed in the Environmental Statement"*. The 2019 Variation Application does not seek to vary the provisions of this Condition.
- 6.2.41 Condition (61) of the 2016 Deemed Planning Permission requires that: *"the environmental effects of the Development must not exceed those assessed in the Environmental Statement"*. The 2019 Variation Application does not seek to vary the provisions of this Condition.
- 6.2.42 Therefore, if an application(s) were to be made under the relevant conditions for agreement in writing or written approval, for further variations to the location, design and / or size of the Proposed Development, the documents to support such applications will include assessments to demonstrate:
- (For Condition (60) of the 2016 Deemed Planning Permission), that the further variations are: *"unlikely to give rise to any materially new or materially different environmental effects from those assessed in the Environmental Statement"*; and,
 - (For Condition (61) of the 2016 Deemed Planning Permission), that the further variations do: *"not exceed those assessed in the Environmental Statement"*.

6.3 Associated Development / Infrastructure Connections

Gas Connection

- 6.3.1 Both Development Option (i) and Development Option (ii) include the construction of a CCGT unit(s). Development Option (ii) additionally includes the construction of an OCGT unit(s). During operation, both the CCGT unit(s) and OCGT unit(s) will burn natural gas only, which will be required to be supplied to the GEC site via an underground gas pipeline.
- 6.3.2 On 8 March 2012, planning permission (Reference: 11/50286/TTGFUL) was granted to GECL by Thurrock Thames Gateway Development Corporation (TTGDC) to: *"develop an underground gas pipeline, an above ground installation (AGI) and ancillary development (including pipeline route markers, cathodic protection posts, M4 marker posts (for special crossings) and landscaping / biodiversity provision)"*.
- 6.3.3 Following discharge of the relevant conditions, this planning permission was implemented on 7 March 2017 by the construction of a new access road to the associated AGI. The

implementation was in accordance with approved drawings and documents, thereby the planning permission is preserved in perpetuity.

- 6.3.4 Under both Development Options, this approximately 8 km long underground gas pipeline is required for the CCGT unit(s) as there is not sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station. The proposed route of this pipeline parallels the route of the existing pipeline for the majority of its length.
- 6.3.5 However, under Development Option (ii), should there be phasing of GEC with the OCGT unit(s) constructed and operated in advance of the CCGT unit, there is sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station for the OCGT unit(s). As it is technical feasible to 'tap-in' to the existing underground gas pipeline, under Development Option (ii), a phase with only OCGT unit(s) would be more cost-competitive in comparison to a phase which also includes the CCGT unit, as the OCGT unit(s) would not be financially overburdened by the cost of the 8 km long underground gas pipeline for the CCGT unit. This would allow the OCGT unit(s) to participate as a separate Capacity Market Unit within the Capacity Market Auction, thereby maximising the potential to successfully secure a Capacity Market Award.
- 6.3.6 Therefore, GECL are currently investigating the potential for a shorter length of underground gas pipeline based on a 'tap-in' to the existing underground gas pipeline serving the existing Coryton CCGT generating station. As part of this 'tap-in', a smaller AGI would also be required. In progressing this investigation, GECL has commissioned some initial gas feasibility work to identify possible new route options and AGI locations. It is currently anticipated that the initial gas feasibility work will be further developed into an application for the shorter length of underground gas pipeline and smaller AGI, most likely an application for planning permission under the Town and Country Planning Act 1990.
- 6.3.7 The quality of the natural gas will be the same as that used in domestic properties and will be supplied to a flanged terminal point at a pressure in the range of approximately 30 to 75 bar(g). There will be gas pressure reduction / and potential for compression facilities on the Proposed Development site to regulate the pressure of the incoming gas supply to that required by the gas turbines.
- 6.3.8 With the exception of temperature and pressure regulation, the natural gas will not be treated on site and no natural gas will be stored on the Proposed Development site.

Electrical Connection

- 6.3.9 For both Development Options, during operation, the electricity generated will be dispatched to the National Grid Electricity National Transmission System via a new HV electrical connection from the GEC site into the existing National Grid Coryton South Substation.
- 6.3.10 On 27 February 2013, planning permission (12/01085/FUL) was granted to GECL by Thurrock Borough Council: *"for the development of a high voltage electrical connection comprising an underground and possible part culverted double circuit 400 kV cable system linking the approved Gateway Energy Centre electrical switchyard/s to the existing National Grid Coryton South Substation, together with an extension to the substation, installation of electrical equipment (including a 400 kV rotating centre post disconnecter, 400 kV surge arrestors, 400 kV air insulated switchgears / gas insulated switchgear buildings, 400 kV gas insulated switchgear circuit breaker, 400 kV gas insulated switchgear cable sealing ends), associated development (including transitional bay, marker posts / plates) and access track works"*.
- 6.3.11 However, this development was not commenced, and the planning permission has since expired. Accordingly, GECL has commissioned some initial electrical feasibility work to identify possible new route options for the HV electrical connection and it is currently anticipated that the initial electricity feasibility work will be developed into an application for the new HV electrical connection, most likely an application for a replacement planning permission under the Town and Country Planning Act 1990.

7. CONSTRUCTION / OPERATION / DECOMMISSIONING

7.1 Introduction

7.1.1 In addition to the description of the Proposed Development provided in Section 6.2 (The Proposed Development), this Section provides additional information on other relevant features covering construction, operational and decommissioning characteristics. In particular, this Section provides a description of:

- The main construction, operational and decommissioning characteristics, including:
 - Energy demand and energy used; and,
 - The nature and quantity of the materials and natural resources used.
- The expected types and quantities of residues and emissions produced during the construction, operational and decommissioning phases, including: emissions to air; noise; vibration; light; emissions to soil and sub-soil; wastes; emissions to water; heat; and, radiation.

7.2 Construction

Main Construction Characteristics

7.2.1 Based on similar experience on the construction of generating stations, a high-level programme of construction activities comprises:

- Provision of temporary construction facilities;
- Undertaking site preparation;
- Installation of foundations;
- Equipment / buildings construction;
- Completion of construction; and,
- Commissioning and handover.

7.2.2 The 2019 Variation Application seeks to allow for a phased development of GEC. For construction of the Proposed Development in as either single-phase or multi-phase, this programme of construction activities would occur for each phase.

Provision of Temporary Construction Facilities

7.2.3 During the construction works, temporary construction facilities (comprising dedicated laydown and storage areas) will be provided for construction plant / equipment. The laydown / storage areas will be available for any fabrication which may be necessary for construction, and will include space for temporary car parking and office accommodation.

7.2.4 The temporary laydown and storage areas will be covered with a suitable material and, as appropriate following construction, all necessary measures will be taken to return the area to its previous state.

7.2.5 These temporary laydown and storage areas be within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent). These areas may include the land which has been set aside for the purposes of CCR.

Site Preparation

7.2.6 In advance of any construction works, a program of clearance, remediation and levelling will be undertaken across the Proposed Development site (or across the part of the Proposed Development site associated with the specified phase of the Proposed Development).

7.2.7 As part of the agreement between GECL and the team behind the DP World® London Gateway Logistics Park, the GEC site will be cleared, remediated and levelled, and provided in a condition that would allow for the construction of GEC. The likely significant effects of the clearance, remediation and levelling works have previously been assessed as part of the historical applications for the DP World® London Gateway sites.

7.2.8 Subsequently, building on the results of site investigations carried out at GEC site and the surrounding the DP World® London Gateway Logistics Park, Condition (45) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme to deal with the risks associated with the contamination of the site has been submitted to and approved in writing by Thurrock Borough Council. The scheme shall include:

- A Preliminary Risk Assessment;
- If required, a Site Investigation Scheme;
- If required, a Method Statement for any additional remediation; and,
- If required, a Verification Plan.

The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme to deal with the risks associated with the contamination of the site associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

7.2.9 Further, Condition (47) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a Verification Report (detailing any additional remediation) for the site has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a Verification Report (detailing any additional remediation) for the site associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

7.2.10 In addition, as the potential exists for possible off-site contamination to migrate onto the GEC site, Condition (49) of the 2016 Deemed Planning Permission requires that, in the event of contamination being found that was not previously identified, works on that part of the site cease, be reported and only re-commence following submission of a scheme to deal with the associated risks.

7.2.11 Notwithstanding the above, during the detailed design and engineering studies, further surveys of the site may be undertaken to confirm the underlying ground conditions. The results of these further surveys would be used to inform the final design and layout of the Proposed Development, and the locations of the main plant / equipment items. The surveys would also be used to inform the locations of the associated underground electrical cables, onsite access roads and other miscellaneous plant / equipment items.

7.2.12 Following the initial (DP World® London Gateway Logistics Park) clearance, remediation and levelling and any further necessary additional remediation and verification, additional site preparation works may comprise the raising of the GEC site (further than any levelling undertaken for the surrounding DP World® London Gateway Logistics Park), earthworks and excavations for the installations of foundations. Indeed, Condition (41) of the 2016 Deemed Planning Permission requires that the Proposed Development shall include for the provision of safe route(s) into and out of the Proposed Development site and for any place of refuge for operational personnel / visitors to be provided at a minimum of 3.7 m AOD. The 2019 Variation Application does not seek to vary this Condition, and the 2019 Updated Flood Risk Assessment confirms that 3.7 m AOD remains valid and appropriate.

[Installation of Foundations](#)

7.2.13 Following all site preparation works, the trenching and installation of underground services will take place.

7.2.14 It is likely that piling will be required for the majority of the heavy equipment items including, but not limited to: the gas turbines; the HRSGs; the steam turbines; and the generators. This is due to their high static or, for rotating plant, dynamic loading, and the tight tolerance requirements for settlement.

Equipment / Building Construction

- 7.2.15 The equipment / building construction works can be considered in terms of the following activities: plant / equipment / building manufacturing and delivery; and, equipment / building erection.
- 7.2.16 During the equipment / building construction works, factory finish painted building steelwork columns frames and roof trusses will be delivered and erected on to cured foundations. Cladding and insulation will be fixed, and the buildings will be made weather tight.
- 7.2.17 Internal walls will be erected where buildings are divided. The buildings will then be fitted with electrical systems, plumbing and drainage.
- 7.2.18 The main pieces of equipment will then be delivered to site, and placed in the completed buildings on their dedicated foundations. Auxiliary equipment, interconnections and acoustic panels will be fitted.

Commissioning / Handover

- 7.2.19 Following the completion of construction, the commissioning / handover works can be considered in terms of the following activities: plant / equipment commissioning; generating station take-over; generating station commercial operation; and, guarantee period.
- 7.2.20 Commissioning will be progressive from final plant / equipment / building erection checks, to pre-commissioning and setting to work of individual component parts, through to the overall equipment / building testing. This commissioning will prove the technical acceptance of the plant / equipment and buildings.
- 7.2.21 Reliability tests will demonstrate the fitness for purpose of the generating station prior to commercial operation.
- 7.2.22 Performance tests will demonstrate that the Proposed Development complies with the performance guarantees.
- 7.2.23 Availability and reliability will also be demonstrated by operating the Proposed Development under commercial conditions for a period without major repair to any item of plant or equipment.

Summary

- 7.2.24 The 2019 Variation Application seeks to allow for a phased development of GEC. For construction of the Proposed Development in as either single-phase or multi-phase, there are no material changes to the main construction characteristics.
- 7.2.25 Furthermore, there are no material changes to the types of construction plant / equipment expected. These include: air compressors; bulldozers; compactors; concrete pumps; cranes; cutters / drills / small tools; diesel generators; excavators (e.g. backhoes / loaders / motor graders); floodlights; fork-lift trucks; paving equipment; piling rigs; pumps; portable compaction equipment; pumps; scaffolding; trucks; and welders.

Construction Working Hours

- 7.2.26 Regarding general construction works, Condition (26) of the 2016 Deemed Planning Permission provides normal construction working hours. The 2019 Variation Application does not seek to vary this Condition. Table 7.1 presents these normal construction working hours.

TABLE 7.1: NORMAL CONSTRUCTION WORKING HOURS

<i>Day</i>	<i>Working Hours</i>
Monday to Saturday	07:00 – 19:00
Sunday or Bank Holiday	N / A

- 7.2.27 Pursuant to Condition (26) of the 2016 Deemed Planning Permission, no construction works will take place outside these hours, unless such work:

- Is associated with an emergency; or,
- Is carried out with the prior written approval of Thurrock Borough Council; or,
- Does not cause existing ambient background noise levels to be exceeded.

7.2.28 Regarding construction works concerning the installation of foundations requiring piling, Condition (27) of the 2016 Deemed Planning Permission provides piling construction working hours. The 2019 Variation Application does not seek to vary this Condition. Table 7.2 presents the piling construction working hours.

TABLE 7.2: PILING CONSTRUCTION WORKING HOURS

<i>Day</i>	<i>Working Hours</i>
Monday to Friday	09:00 – 18:00
Saturday	09:00 – 13:00
Sunday or Bank Holiday	N / A

7.2.29 Pursuant to Condition (27), no installation of foundations requiring piling will take place outside these hours, unless such work:

- Is associated with an emergency; or,
- Is carried out with the prior written approval of Thurrock Borough Council.

7.2.30 Regarding all vehicle movements associated with the construction works, Condition (22) of the 2016 Deemed Planning Permission provides construction working hours where no vehicle movements are permitted. The 2019 Variation Application does not seek to vary this Condition. Table 7.3 presents the construction working hours where no vehicle movements are permitted.

TABLE 7.3: CONSTRUCTION WORKING HOURS WHERE NO VEHICLE MOVEMENTS ARE PERMITTED

<i>Day</i>	<i>Working Hours</i>
Monday to Friday	07:00 – 09:00 / 17:00 – 18:00
Saturday	07:00 – 08:00 / 17:00 – 18:00

7.2.31 Pursuant to Condition (22), no vehicle movements are permitted, unless such a vehicle movement:

- Is associated with an emergency;
- If entering the site, originates within the administrative area of Thurrock Borough Council;
- If leaving the site, terminates within the administrative area of Thurrock Borough Council; or,
- Is carried out with the prior written approval of Thurrock Borough Council.

7.2.32 Regarding heavy commercial vehicle movements associated with the construction works, Condition (21) of the 2016 Deemed Planning Permission provides heavy commercial vehicle movement construction working hours. The 2019 Variation Application does not seek to vary this Condition. Table 7.4 presents the heavy commercial vehicle movement construction working hours.

TABLE 7.4: HEAVY COMMERCIAL VEHICLE MOVEMENTS CONSTRUCTION WORKING HOURS

<i>Day</i>	<i>Working Hours</i>
Monday to Saturday	10:00 – 16:00
Sunday or Bank Holiday	N / A

- 7.2.33 Pursuant to Condition (21), no heavy commercial vehicle movements will take place outside these hours, unless such work:
- Is associated with an emergency;
 - If entering the site, originates within the administrative area of Thurrock Borough Council;
 - If leaving the site, terminates within the administrative area of Thurrock Borough Council;
 - Is carried out with the prior written approval of Thurrock Borough Council; or,
 - Is an abnormal / indivisible load authorised by Highways England pursuant to the Road Vehicles (Authorisation of Special Types) (General) Order 2003.

[Summary](#)

- 7.2.34 The 2019 Variation Application seeks to allow for a phased development of GEC. For construction of the Proposed Development in as either single-phase or multi-phase, there are no material changes to the construction working hours.

Construction Environmental Management

- 7.2.35 The Construction Contractor(s) will be required to prepare and implement a Construction Environmental Management Plan(s) (CEMP(s)).

- 7.2.36 The objective of the CEMP(s) will be to:

- Identify legal, environmental and other obligations and requirements appropriate to the construction of the Proposed Development (or relevant phase of the Proposed Development);
- Provide a framework to comply with the identified legal, environmental and other obligations and requirements through appropriate mitigation and monitoring;
- (Based on the identified mitigation and monitoring measures), provide the basis for setting objectives and targets for construction of the Proposed Development (or relevant phase of the Proposed Development); and,
- Demonstrate a professional approach to environmental management.

- 7.2.37 Condition (25) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a CEMP has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a CEMP associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

[Summary](#)

- 7.2.38 The 2019 Variation Application seeks to allow for a phased development of GEC. For construction of the Proposed Development in as either single-phase or multi-phase, there are no material changes to construction environmental management.

Energy Demand and Energy Used / Materials and Natural Resources Used

- 7.2.39 For both Development Option (i) and Development Option (ii), the energy demand and energy used during construction of the Proposed Development will be typical of those experienced during construction of generating stations. Whilst the phasing of the Proposed Development may alter the specific timings, there will be no material changes to the overall energy demand and energy use.
- 7.2.40 The precise nature and quantities of materials and natural resources to be used during construction are not yet known. However, based on similar experience on the construction of generating stations, Table 7.5 provides a summary of the different types of materials and natural resources to be used during construction. In addition to the materials and natural resources listed, a small amount of water will be required each day for the general construction works. It is proposed that this will either be taken from the

mains supply within the DP World® London Gateway sites or from a new mains water connection.

TABLE 7.5: TYPES OF MATERIALS AND NATURAL RESOURCES TO BE USED DURING CONSTRUCTION

<i>Programme Item</i>	<i>Materials / Natural Resources Previously Described</i>	<i>Main Respects in which the Materials / Natural Resources Differ from those Previously Described</i>
Provision of Temporary Construction Facilities / Site Preparation	Concrete; drainage and service media; granular and lightweight service fill material; pre-cast concrete paving; reinforcement steel; resin-bonded gravel; tarmac; and, terram (geotextile membrane).	No change.
Installation of Foundations Equipment / Building Construction	Concrete; curtain walling; cladding; glass; structural steel; waterproof membranes; and, terram (geotextile membrane).	No change (the materials and natural resources for the CCGT unit(s) or the CCGT unit, the OCGT unit(s) and the BESS are provided for operation).
Commissioning / Handover	Cabling and service media; metal (studwork and finishing elements); paint and finishing products; pipe; plasterboard; pre-packaged service plant; and, timber.	No change.

Summary

7.2.41 There are no material changes to the proposed materials and natural resources to be used during construction.

Construction Residues and Emissions

7.2.42 For both Development Option (i) and Development Option (ii), Table 7.6 provides a summary of the construction residues and emissions for the Proposed Development. Further information is provided in the Impact Assessment Sections 8 to 17.

TABLE 7.6: SUMMARY OF CONSTRUCTION RESIDUES AND EMISSIONS

	<i>Construction Residue / Emission Previously Described</i>	<i>Main Respects in which the Construction Residue / Emission Differs from that Previously Described</i>
Emissions to Air (also see information provided in Section 8 (Air Quality))	<p>Comprising:</p> <ul style="list-style-type: none"> • Dust-generating construction works, including: <ul style="list-style-type: none"> - Earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow; - Vehicle movements. • Emissions from construction plant / equipment / vehicles; and, • Unplanned releases / spills. 	<p>Whilst the construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described.</p>
Noise and Vibration (also see information provided in Section 9 (Noise and Vibration))	<p>Comprising:</p> <ul style="list-style-type: none"> • Noise and vibration-generating construction works, including earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow; • Noise and vibration-generating construction plant / equipment / vehicles. 	<p>Whilst the construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the Proposed Development will not cause noise and vibration that materially differs from that previously described.</p>
Lighting (also see information provided in Section 10 (Landscape and Visual))	<p>Comprising:</p> <ul style="list-style-type: none"> • The use of lighting to ensure that the construction personnel can move around the Proposed Development site safely during the hours of darkness. 	<p>The Proposed Development will not cause the release of light that materially differs from that previously described.</p>
Emissions to Soil / Sub-Soil (also see information provided in Section 12 (Ground Condition: Geology and Land Contamination))	<p>Comprising:</p> <ul style="list-style-type: none"> • Release of contaminants due to construction works / activities across the Proposed Development site; • Discharges of pollutants to land; and, • Unplanned releases / spills. 	<p>Whilst the construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the Proposed Development will not lead to risks of contamination of land which materially differ from those previously described.</p>
Wastes	<p>The types of waste that are expected to arise include: demolition / clearance waste; non-structural steel waste; structural steel waste; concrete waste; packaging waste; controlled waste; cable cut-offs; insulation and cladding waste; waters.</p>	<p>Whilst the construction of the Proposed Development may include a number of phases, there are no material changes to the types of waste expected to arise.</p>
Emissions to Water (also see information provided in Section 13 (Water Resources and Flood Risk))	<p>Comprising:</p> <ul style="list-style-type: none"> • Discharges of pollutants to water; and, • Unplanned releases / spills. 	<p>Whilst the construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the Proposed Development will not lead to risks of contamination of water which materially differ from those previously described.</p>
Heat / Radiation	<p>During construction, there will be no material emissions of heat / radiation.</p>	<p>No change.</p>

Construction Site Access

- 7.2.43 During construction, site access will be via the DP World® London Gateway Site Access Road, which is a two-lane dual carriageway, from the A1014 (The Manorway) / Sorrell Roundabout into the DP World® London Gateway sites. This Site Access Road was completed in 2013.

Construction Personnel

- 7.2.44 For construction of the Proposed Development in one phase, approximately 600 construction personnel will be employed. GECL is expecting that a number of construction employment opportunities will be created in the local area.
- 7.2.45 For construction of the Proposed Development over a number of phases, there will be no material changes to the types of construction skills required. However, for construction of the Proposed Development over a number of phases, the short-term employment opportunities and associated increase in the use of local services per phase would be reduced, but would be experienced over a longer overall period.

7.3 Operation

Main Operational Characteristics / Process Description

- 7.3.1 The Proposed Development will have an operational lifetime of approximately 35 years.
- [Development Options](#)
- 7.3.2 The 2019 Variation Application seeks to vary Condition 2(a) of the 2016 Varied Consent to provide that GEC shall remain up to 1250 MW, but shall comprise either:
- Development Option (i):
Up to two CCGT units with a rated electrical output of up to 1250 MW; or,
 - Development Option (ii):
 - (1) One CCGT unit with a rated electrical output of up to 630 MW;
 - (2) One of more OCGT units having a combined rated electrical output of less than 300 MW; and,
 - (3) A BESS with a rated electrical output of up to 320 MW.
- 7.3.3 The CCGT unit(s) and the OCGT unit(s) will burn natural gas only, which is an inherently clean fuel and does not produce the sulphur dioxide (SO₂) or particulate matter (PM) emissions associated with burning coal. As a result, all atmospheric emissions from the Proposed Development will be controlled at source and no flue gas cleaning equipment is required. Back-up firing on Distillate Fuel Oil (DFO), or any other fuel, is not proposed.
- [Development Options Technologies](#)
- CCGT Unit(s)***
- 7.3.4 Under the varied Condition 2(a):
- For Development Option (i), there would be up to two CCGT units with a rated electrical output of up to 1250 MW; or,
 - For Development Option (ii), there would be one CCGT unit with a rated electrical output of up to 630 MW.
- 7.3.5 Each CCGT unit will comprise: a gas turbine; a HRSG; steam turbine plant; and, associated equipment.
- 7.3.6 Within each CCGT unit, the natural gas will be burnt in the combustion chamber of the gas turbine from where the resulting hot gases will expand through the turbine section to generate sufficient power to drive the air compressor section and generator to produce electrical power. The hot exhaust gases still contain recoverable energy and will therefore be used in a HRSG to generate steam, which will be expanded in steam turbine plant to produce additional electrical power.

- 7.3.7 The steam exhausting the steam turbine plant will pass to an air cooled condenser (ACC) where it will be condensed. The resulting condensate will be returned to the HRSG to continue the steam cycle.
- 7.3.8 The use of ACCs has the potential to reduce environmental impacts associated with other cooling systems, and is considered to have the following benefits:
- No abstraction of surface water;
 - No visible cooling tower plumes;
 - No discharge of heated cooling water; and,
 - Significantly lower water consumption.
- 7.3.9 The flue gases will be discharged via a dedicated stack.
- 7.3.10 The use of a combined gas and steam cycle increases the overall fuel efficiency of the generating station. As such, the CCGT unit(s) will be capable of generation in combined cycle mode with an overall electrical generation efficiency of approximately 57 to 60.5% based on the Lower Calorific Value (LCV) of the fuel.

OCGT Unit(s)

- 7.3.11 Under the varied Condition 2(a):
- For Development Option (ii), there would be one or more OCGT(s) unit having a combined rated electrical output of less than 300 MW.
- 7.3.12 Each OCGT unit will comprise: a gas turbine; and, associated equipment. Indeed, in essence, an OCGT unit comprises the prime driver of a CCGT unit, which is the gas turbine.
- 7.3.13 Within each OCGT unit (and as with a CCGT unit), the natural gas will be burnt in the combustion chamber of the gas turbine from where the resulting hot gases will expand through the turbine section to generate sufficient power to drive the air compressor section and generator to produce electrical power.
- 7.3.14 As there is no steam cycle, there is no condensing of steam and associated cooling requirement. Whilst auxiliary cooling is still required, this is significantly lower for an OCGT unit than for a CCGT unit.
- 7.3.15 The flue gases will be discharged via a dedicated stack. The stack normally contains a silencer to reduce noise emissions. Due to the higher stack exit temperature, the stacks for OCGT units are generally shorter than those for CCGT units.
- 7.3.16 The OCGT unit(s) will have an electrical generation efficiency between approximately 36 to 41.5% based on the LCV of the fuel.

Comparison of CCGT Units and OCGT Units

- 7.3.17 Table 7.7 provides a high-level comparison of a number of the key differences between CCGT units and OCGT units.

TABLE 7.7: COMPARISON BETWEEN CCGT UNITS AND OCGT UNITS

<i>Parameter</i>	<i>CCGT</i>	<i>OCGT</i>
Efficiency	Between approximately 57 to 60.5% based on the LCV of the fuel	Between approximately 36 to 41.5% based on the LCV of the fuel
Start Up Time	Between 30 to 180 minutes	Between 20 to 30 minutes
Cooling	Required for steam condensing and auxiliaries (larger requirement)	Required for auxiliaries only (smaller requirement)
Stack Height	Typically larger, on the Proposed Development will be up to approximately 75 m	Typically smaller, on the Proposed Development will be up to approximately 42 m

The Battery Energy Storage System

- 7.3.18 Under the varied Condition 2(a):
- For Development Option (ii), there would be a BESS with a rated electrical output of up to 320 MW.
- 7.3.19 The BESS will comprise:
- Batteries, housed in enclosures, also including:
 - Control and protection systems;
 - Chillers / cooling systems (to ensure temperature control); and,
 - A power conversion system (to convert Alternating Current (AC) into Direct Current (DC) during energy charging, or to convert DC into AC during energy discharging).
 - Transformers and switchgear.
- 7.3.20 Although the battery types may be varied throughout the Proposed Development's operational lifetime, it is currently envisaged that lithium-ion batteries will be used during the initial operational phase³⁸.

Performance

- 7.3.21 It is expected that for the majority of their operational lifetime, the CCGT unit(s) and the OCGT unit(s) will operate in various running modes including (but not limited to) baseload and cycling. The BESS will operate in either 'energy charge', 'energy storage' or 'energy discharge' modes.
- 7.3.22 The performance of the CCGT unit(s) and the OCGT unit(s) will be continuously recorded to ensure correct and efficient operation. Any significant deviations will be alarmed, and corrections will be applied. Records will be maintained of performance, including any deviations.
- 7.3.23 The CCGT unit(s) and the OCGT unit(s) will be occasionally shut down for period of essential maintenance and inspection. For both the CCGT unit(s) and the OCGT unit(s), minor outages (of the order of 4 days) are expected to occur every year. For the CCGT unit(s), major outages (of the order of 4 weeks) are expected to occur every three years, and will be planned on a long-term basis.
- 7.3.24 The Proposed Development will be designed with a view to a high degree of automatic operation. However, operator intervention will be necessary from time to time. Full facilities for interfacing information and control / protection / alarm systems will be installed so that the Proposed Development can be operated efficiently and safely from a Central Control Room via a Distributed Control System (DCS).

Control Systems

- 7.3.25 Control systems and facilities will be provided throughout the Proposed Development site.
- 7.3.26 Furthermore, back up systems will be provided to deal with emergency situations, including: electrical power failure; water supply failure; compressed air failure; major equipment failure; and, lightning strikes. In terms of electrical power failure, emergency generators will be installed to provide emergency back-up and enable the Proposed Development to be shut down in a safe manner. Under normal circumstances, it is expected that these emergency generators would only be operated for testing purposes and short durations.
- 7.3.27 In addition, the Proposed Development will employ conventional protective features, including: detection and alarm systems; emergency relief valves; shut-down sequence interlocks; safety interlocks; fail safes; and, mechanical / electrical protective devices.

³⁸ Regarding other battery types, it is understood that lithium-ion batteries will continue to be the battery chemistry of choice for the foreseeable future, largely due to the upfront investment in this battery chemistry from the automotive industry in large-scale manufacturing capacity for the electric vehicle market.

Fire Protection and Detection Systems

- 7.3.28 Fire protection and detection systems will be provided throughout the Proposed Development site. This will cover all equipment on the Proposed Development site that could constitute a fire risk.
- 7.3.29 The fire protection and detection system (which will incorporate heat sensors) will be used in conjunction with automatic spray nozzles, smoke detectors, fire alarms and typical portable appliances. Fire water will be stored in a combined raw water / fire water tank on the Proposed Development site. The volume of water required for fire protection will be reserved such that it can only be used for this purpose.
- 7.3.30 For the protection of the lubricating oil tank, coolers and associated pipeline and any steam turbine bearings, an automatic high velocity water spray system (or similar) will be provided. For the protection of equipment within each gas turbine unit where water spray could cause damage, a total flood CO₂ system (or similar equivalent approved gas extinguishing system) will be provided.
- 7.3.31 For the CCGT unit and the OCGT unit, continuous natural gas monitoring systems will be provided. Venting systems will be designed to prevent explosion of air / gas accumulations. Ignition sources will be protected from damage through their design. In addition, wherever possible, the equipment and buildings will be made of non-combustible and fire-resistant materials.
- 7.3.32 The testing of the fire protection and detection system will be carried out in accordance with an Emergency Response Plan.

Operational Environmental Management

- 7.3.33 During operation, activities on the GEC site will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016. GECL already holds an Environmental Permit for the development permitted by the 2014 Varied Consent (EPR/EP3536EN) issued in July 2016. Based on the Development Option selected, an application to vary this Environmental Permit will be made in due course.
- 7.3.34 In addition, regarding emissions of CO₂, the Proposed Development will be required to apply for an EU Emissions Trading Scheme (ETS) Permit. The scheme is currently operating in Phase III, which runs from 1 January 2013 to 31 December 2020. Phase IV will run from 1 January 2021 to 31 December 2030.

Energy Demand and Energy Used / Materials and Natural Resources Used

- 7.3.35 Both Development Option (i) and Development Option (ii) include the construction of a CCGT unit(s). Development Option (ii) additionally includes the construction of an OCGT unit(s). The CCGT unit(s) or the CCGT unit and OCGT unit(s) will burn natural gas only.
- 7.3.36 Under Development Option (ii), electricity 'generation' from an electrochemical (battery) energy storage system is preferred technology and although the battery types may be varied throughout the lifetime of the BESS, it is currently envisaged that lithium-ion batteries will be used during the initial operational phase³⁹.

Operational Residues and Emissions

- 7.3.37 For both Development Option (i) and Development Option (ii), Table 7.8 provides a summary of the operational residues and emissions for the Proposed Development. Further information is provided in the Impact Assessment Sections 8 to 17.

³⁹ Regarding other battery types, it is understood that lithium-ion batteries will continue to be the battery chemistry of choice for the foreseeable future, largely due to the upfront investment in this battery chemistry from the automotive industry in large-scale manufacturing capacity for the electric vehicle market.

TABLE 7.8: SUMMARY OF OPERATIONAL RESIDUES AND EMISSIONS

	<i>Operational Residue / Emission Previously Described</i>	<i>Main Respects in which the Operational Residue / Emission Differs from that Previously Described</i>
<i>Emissions to Air (also see information presented in Section 8 (Air Quality))</i>		
Emissions from the stack(s) of the CCGT unit(s) / emissions from the stack(s) of the OCGT unit(s)	Flue gases containing nitrogen oxides (NO _x), carbon monoxide (CO), carbon dioxide (CO ₂) and water vapour. The CCGT unit(s) and the OCGT unit(s) will burn natural gas only, which is an inherently clean fuel and does not produce the SO ₂ or PM emissions associated with burning coal. As a result, all atmospheric emissions from the Proposed Development will be controlled at source and no flue gas cleaning equipment is required.	Under Development Option (i), the CCGT unit(s) will not release any pollutants or substances to air which materially differ from those previously described. Under Development Option (ii), there will be no emissions from the BESS, and the CCGT unit and OCGT unit(s) will not release any pollutants or substances to air which materially differ from those previously described.
Emissions from the safety vents on the natural gas system	In line with all existing gas fired generating stations, under both Development Option (i) and Development Option (i), there will be infrequent venting of very low volumes of natural gas through vents open to the atmosphere at around 20 m above ground level. The infrequent venting will be carried out in a controlled manner by the operators using remote activated relief valves positioned at appropriate locations in the natural gas system. A log will be maintained by the site staff for reporting to the relevant authorities. The venting will be used to allow for maintenance activities within the gas system and to support start-up and shut-downs. Based on the anticipated height of venting, the infrequent timing and the fact that gas volumes are likely to dissipate quickly, the venting of gas will not cause any danger in the vicinity of the Proposed Development site.	No change.
Emissions from the BESS	N / A	There will be no material emissions to air from the BESS.
<i>Noise and Vibration Emissions (also see information presented in Section 9 (Noise and Vibration))</i>		
Key sources of noise emissions	The principal sources of steady state noise during operation will be: <ul style="list-style-type: none"> For the CCGT unit: air inlets; gas turbines; HRSGs; steam turbine plant; stacks; ACC; fin-fan coolers; and, transformers. For the OCGT unit(s): air inlets; gas turbines; stacks; fin-fan coolers; and, transformers. Other plant / equipment: Gas Receiving Facility (GRF). The noise will be of a steady nature, and similar to that of other gas fired generating stations. Best Available Techniques will be addressed in the design to ensure appropriate noise attenuation measures are employed.	Under Development Option (i), the CCGT unit(s) will not cause noise and vibration that materially differs from that previously described. Under Development Option (ii), there will be some minor noise emissions from the BESS, the CCGT unit and the OCGT unit(s) remain the major noise emitters. Therefore, the Proposed Development will not cause noise and vibration that materially differs from that previously described.

	<i>Operational Residue / Emission Previously Described</i>	<i>Main Respects in which the Operational Residue / Emission Differs from that Previously Described</i>
Lighting (also see information presented in Section 10 (Landscape and Visual))		
Lighting	Under both Development Option (i) and Development Option (ii), there will be low level operational lighting to ensure that operational personnel can move around the Proposed Development site safely during the hours of darkness.	No change.
Emissions to Soil / Sub-Soil (also see information presented in Section 12 (Ground Conditions (Geology and Land Contamination)))		
Operating Materials	For both Development Option (i) and Development Option (ii), miscellaneous operating materials (i.e. oils, greases, chemicals) will be stored in appropriately bunded and secure areas within the on site stores.	No change.
Lubricating Oils	For both Development Option (i) and Development Option (ii), lubricating oils will be supplied to the gas turbines, any steam turbine equipment and generator bearings. The lubricating oils will also be supplied to the turbine control and hydraulic oil systems. The lubricating oils will be stored on the Proposed Development site within tanks in an impermeable bund sized to contain 110% of the contents of each tank, in line with the Control of Pollution (Oil Storage) (England) Regulations 2001. Used lubricating oils will also be stored on the site for re-use or will be disposed of offsite by an approved and licensed contractor in accordance with applicable regulations for treatment and disposal at an appropriate facility.	No change.
Chemical Usage	For both Development Option (i) and Development Option (ii), small quantities of sodium phosphate, oxygen scavenger, ammonia and other chemicals will be used in CCGT unit(s) HRSG water dosing. All such chemicals will be retained in suitable containment areas on the site, and will be shielded from the atmosphere. Air discharged from the shields will pass through a device (such as a common water seal and an active carbon filter) where appropriate to avoid the uncontrolled release of these chemicals to the atmosphere.	No change.

	<i>Operational Residue / Emission Previously Described</i>	<i>Main Respects in which the Operational Residue / Emission Differs from that Previously Described</i>
Transformer / Transformer Oils	For both Development Option (i) and Development Option (ii), transformers will be provided on site to allow the export of power and also for the power plant to receive electrical supplies from the wider National Grid National Electricity Transmission System. All major transformers are anticipated to be oil filled and each transformer would be provided with a containment bund / catch pit that will be capable of containing 110% of the contents of the transformer, in line with the Control of Pollution (Oil Storage) (England) Regulations 2001. In addition, the containment bund / catch pit volume would be sized to accommodate the fire water deluge quantities as required by fire fighting codes and standards for extinguishing a transformer fire. All storage facilities would be designed, situated and used in compliance with the Control of Substances Hazardous to Health (COSHH) Regulations 2002.	No change.
Leakages / Spills	Under both Development Option (i) and Development Option (ii), an oil spill or chemical spill is recognised as being the principal environmental emergency that could arise at the Proposed Development site. As such, an Emergency Response Plan will be produced for the Proposed Development which will include: emergency procedures for leaks / spills from chemical tanks; and, emergency procedures for leaks / spills of lubricating oil. There will be appropriate drains within the various bunded areas, and all valves / couplings will be within the bunded area. In the event of oil leak / spill from any oil storage tank, any oil will be contained within the bunded area surrounding the storage tank. Any oil found in a bunded area will be removed by an approved and licensed contractor in accordance with applicable regulations for treatment and disposal at an appropriate facility.	No change.
Wastes		
Combustion Process	An inherent characteristic of gas fired generating stations is that waste quantities are small and are minimised by design. In particular, CCGT units are recognised as one of the most efficient users of raw materials for electricity generation. The use of natural gas as fuel ensures no solid waste is produced in the combustion process. Therefore, there will be no direct emissions to land from the CCGT unit(s) or the CCGT unit and the OCGT unit(s).	Under Development Option (i), there will be no change to the wastes from the combustion process of the CCGT unit(s). Under Development Option (ii), the BESS will not have a 'combustion process', and there will be no change to the wastes from the combustion processes of the CCGT unit and the OCGT unit(s).

	<i>Operational Residue / Emission Previously Described</i>	<i>Main Respects in which the Operational Residue / Emission Differs from that Previously Described</i>
General Site Operations	Limited amounts of solid waste will be generated by site operations (e.g. general office wastes / used gas turbine air intake filters (typically replaced annually) / separated oil and sludge from oil-water separators / used oil, chemicals or chemical containers). These wastes will be collected and disposed of off site by an approved and licensed contractor in accordance with applicable regulations for treatment and disposal at an appropriate facility.	Under Development Option (i), there will be no change to the wastes from general site operations. Under Development Option (ii), the BESS will not produce wastes during general operation, and there will be no change to the wastes from general operation of the CCGT unit and the OCGT unit(s).
HSE Requirements	There will be no substances stored on the Proposed Development site that will make the site notifiable to the Health and Safety Executive (HSE) under the Control of Major Accident Hazards (COMAH) Regulations 2015.	No change.
<i>Emissions to Water (also see information presented in Section 13 (Water Resources and Flood Risk))</i>		
HRSB Blowdown	Within the CCGT unit, the water quality in the HRSB circuit is of high purity, containing very small quantities of corrosion and scaling prevention chemicals. However, to control the build up of impurities in the HRSB water, it is necessary to discharge some steam / water from the system as blowdown. Any losses are made up with high quality feed water from the town's water main, which will be demineralised in the water treatment plant prior to use. The blowdown is discharged at boiler temperature and pressure. Some of the blowdown flashes off to steam in the boiler blowdown vessel, reducing the volume still further.	No change.
Miscellaneous Discharges / Emissions	For both Development Option (i) and Development Option (ii), it will occasionally be necessary to wash the blades of the air compressor section of the gas turbines to remove debris that has penetrated the inlet air filters and become lodged on the compressor blades. This will be done at times when the performance of the gas turbines has degraded and will depend upon the air quality in the vicinity of the Proposed Development site. Washing can be done in two ways, either by: <ul style="list-style-type: none"> • On-line washing where a fine spray of water is allowed to pass through the gas turbine; or • Off-line washing where the compressor blades are rotated slowly through a detergent solution. 	Under Development Option (i), there will be no change to the requirement for washing for the CCGT unit(s). Under Development Option (ii), there will be no requirement for washing for the BESS, and there will be no change to the requirement for washing for the CCGT unit and the OCGT unit(s).

	<i>Operational Residue / Emission Previously Described</i>	<i>Main Respects in which the Operational Residue / Emission Differs from that Previously Described</i>
Drainage	<p>There are expected to be four new drainage systems on the Proposed Development site, including:</p> <ul style="list-style-type: none"> • The surface water drainage system; • The oily water drainage system; • The contaminated wastewater system (i.e. purge water from the water treatment plant effluent); and • The onsite sewerage system. 	No change.
Leakages / Spills	<p>For both Development Option (i) and Development Option (ii), an oil spill or chemical spill is recognised as being the principal environmental emergency that could arise at the Proposed Development site. As such, an Emergency Response Plan will be produced for the Proposed Development which will include: emergency procedures for leaks / spills from chemical tanks; and, emergency procedures for leaks / spills of lubricating oil. There will be appropriate drains within the various bunded areas, and all valves / couplings will be within the bunded area. In the event of oil leak / spill from any oil storage tank, any oil will be contained within the bunded area surrounding the storage tank. Any oil found in a bunded area will be removed by an approved and licensed contractor in accordance with applicable regulations for treatment and disposal at an appropriate facility.</p>	No change.
Other		
Heat	<p>The CCGT unit(s) or the CCGT unit and the OCGT unit(s) will produce emissions of heat. These will be used within the Proposed Development to generate electricity.</p>	<p>Under Development Option (i), there will be no change to the use of heat to generate electricity from the combustion process of the CCGT unit(s).</p> <p>Under Development Option (ii), the BESS will not produce material emissions of heat, and there will be no change to the use of heat to generate electricity from the combustion processes of the CCGT unit and the OCGT unit(s).</p>
Radiation	<p>Not considered applicable to the Proposed Development.</p>	No change.

Operational Site Access

- 7.3.38 During operation, site access will be via the DP World® London Gateway Site Access Road, which is a two-lane dual carriageway, from the A1014 (The Manorway) / Sorrell Roundabout into the DP World® London Gateway sites. This Site Access Road was completed in 2013.

Operational Employment

- 7.3.39 Should the Proposed Development be operated in conjunction with the existing Coryton CCGT generating station, approximately 15 to 25 operational personnel would be employed. Of these, approximately 10 personnel would work 'standard' hours (08:00 to 16:15). The balance would then either work 'day-shift' hours (07:00 to 19:00) or 'night-shift' hours (19:00 to 07:00). Furthermore, in this instance, it may be that the Proposed Development is operated remotely from the existing Coryton CCGT generating station site.
- 7.3.40 Should the Proposed Development be operated 'stand-alone', approximately 40 operational personnel would be employed. Similarly, of these, approximately 10 personnel would work 'standard' hours (08:00 to 16:15). The balance would then either work 'day-shift' hours (07:00 to 19:00) or 'night-shift' hours (19:00 to 07:00).

7.4 Decommissioning

Main Decommissioning Characteristics

- 7.4.1 Following operation for up to approximately 35 years, the Proposed Development will be decommissioned.
- 7.4.2 Decommissioning will take account of the prevailing environmental legislation and guidance in place at the time. Notice will be given to the relevant statutory authorities (including BEIS, the Environment Agency and Thurrock Borough Council), and any necessary permissions will be obtained.
- 7.4.3 Alternatively, if market conditions and / or electricity supply constraints at the time of decommissioning indicate that it would be appropriate to extend the lifetime of the Proposed Development, then decommissioning may be deferred. In order to ensure continuing plant / equipment conditions and environmental performance, the Proposed Development will be re-engineered and re-permitted as required, in accordance with the prevailing environmental legislation and guidance in place at the time.

Decommissioning Environmental Management

- 7.4.4 The Decommissioning Contractor(s) will be required to prepare and implement a Decommissioning Environmental Management Plan(s) (DEMP(s)).
- 7.4.5 The objectives of the DEMP will be to:
- Identify legal, environmental and other obligations and requirements appropriate to decommissioning of the Proposed Development (or relevant phase of the Proposed Development);
 - Provide a framework to comply with the identified legal, environmental and other obligations and requirements through appropriate environmental management measures;
 - (Based on the identified environmental management measures), provide the basis for setting objectives and targets for decommissioning of the Proposed Development (or relevant phase of the Proposed Development); and,
 - Demonstrate a professional approach to environmental management.
- 7.4.6 Condition (56) of the 2016 Deemed Planning Permission requires that within 6 months of the Proposed Development ceasing to be used for the purposes of electricity generation, a DEMP be submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that within 6 months of a specified phased of the Proposed Development ceasing to be used for the purposes of electricity generation, a DEMP associated with the specified phase of the Proposed Development be submitted to and approved in writing by Thurrock Borough Council.

7.5 Main Respects in which the Likely Significant Effects will Differ

- 7.5.1 Table 7.9 presents the specific questions designed to determine the main respects in which the likely effects of the relating to construction, operation and decommissioning of the Proposed Development will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 7.9: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT EFFECTS OF CONSTRUCTION / OPERATION / DECOMMISSIONING WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>		
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>		
Will construction / operation / decommissioning of the Proposed Development use natural resources (such as: land; water; materials / energy), especially any natural resources which are non-renewable or in short supply, in a way which differs from that previously described?	N	Whilst construction of the Proposed Development may include a number of phases, there are no material changes to main construction characteristics, and the construction of the Proposed Development will not use material amounts of natural resources in a way which materially differs from that previously described. Similarly, decommissioning of the Proposed Development will not use material amounts of natural resources in a way which materially differs from that previously described.	N	N / A
	Y	During operation: <ul style="list-style-type: none"> Under Development Option (i), the Proposed Development will not use material amounts of natural resources in a way which materially differs from that previously described. Under Development Option (ii), the Proposed Development will include a BESS, which will contain materials which differ from those previously described. 	N	Whilst, under Development Option (ii), the Proposed Development will contain materials which differ from those previously described (i.e. the BESS), these materials will be procured, used and disposed of in accordance with the supplier's instructions, prevailing environmental legislation / guidance and best practice, such that the likely significant effects on the environment will be materially the same as those previously described.

Potential for the Likely Significant Effects on the Environment to Differ		Is there a Need for Further Assessment?		
Question:	Y / N (Briefly Describe)	Y / N (Briefly Describe)		
Will construction / operation / decommissioning of the Proposed Development involve the use / storage / transport / handling / production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health in a way which differs from that previously described?	N	Whilst construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the construction of the Proposed Development will not involve the use / storage / transport / handling / production of material amount of substances and materials which could be harmful to human health or the environment in a way which materially differs from that previously described. Similarly, decommissioning of the Proposed Development will not involve the use / storage / transport / handling / production of material amount of substances and materials which could be harmful to human health or the environment in a way which materially differs from that previously described.	N	N / A
	N	During operation: <ul style="list-style-type: none"> Under Development Option (i), the Proposed Development will not involve the use / storage / transport / handling / production of substances or materials which could be harmful to human health or the environmental in a way which materially differs from that previously described. Under Development Option (ii), the Proposed Development will include a BESS, which will involve the use / storage / transport / handling / production of substances or materials which differ from those previously described, the substances and materials will not be harmful to human health or the environmental in a way which materially differs from that previously described. 	N	N / A
Will the Proposed Development produce solid wastes during construction / operation / decommissioning which differ from those previously described?	N	The Proposed Development will not produce solid wastes which materially differ from those previously described.	N	N / A

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>			<i>Is there a Need for Further Assessment?</i>	
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>		<i>Y / N (Briefly Describe)</i>	
Will there be any risk of accidents during construction / operation / decommissioning of the Proposed Development which could affect human health or the environment in a way which differs from that previously described?	N	There are no risks of accidents which could affect human health and / or the environment in a way which materially differs from that previously described.	N	N / A

7.6 Need for an Updated Impact Assessment

Construction / Decommissioning

- 7.6.1 The information contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remains valid and appropriate.

Operation

- 7.6.2 The information contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remains valid and appropriate.

8. AIR QUALITY

8.1 Introduction

8.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding air quality;
- The likely significant direct and indirect / secondary effects of the Proposed Development on air quality previously described; and,
- The main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on air quality will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

8.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on air quality.

8.1.3 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

8.2 Current State of the Environment (Baseline Scenario)

Basis

8.2.1 The current state of the environment regarding air quality is based on:

- The most recent publications from Thurrock Borough Council;
- Available data from the Department for Environment, Food and Rural Affairs (DEFRA) (available at: <http://uk-air.defra.gov.uk/>); and,
- Information from DP World® London Gateway's ambient air quality monitoring.

Air Quality Management Areas

8.2.2 It is important that the Proposed Development does not lead to the exacerbation of existing air quality problems encountered in the area. Therefore, receptors that must be given special consideration include Air Quality Management Areas (AQMAS) as designated by the local authority (Thurrock Borough Council).

8.2.3 Therefore, as with the February 2010 ES, the August 2014 ES FID and the February 2016 ES FID, the current state of the environment, regarding AQMAS, has been determined by examining the latest Thurrock Borough Council ambient air quality data. For this 2019 ES FID, the latest Thurrock Borough Council ambient air quality data is included in '2018 Air Quality Annual Status Report (ASR)' (September 2018)⁴⁰. Table 8.1 presents a summary of the AQMAS within the Thurrock Borough Council area.

⁴⁰ Thurrock Borough Council: '2018 Air Quality Annual Status Report (ASR)' (September 2018). Available at: <https://www.thurrock.gov.uk/sites/default/files/assets/documents/air-quality-report-2018.pdf>

TABLE 8.1: AQMAs WITHIN THE THURROCK BOROUGH COUNCIL AREA

AQMA	Location / Description	Date of Declaration	Pollutant (and Objective)
AQMA 1	Grays Town Centre (London Road, Orsett Road and Stanley Road). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 2	Grays, South Stifford (London Road South Stifford). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 3	Grays (Hogg Lane and Elizabeth Road). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 4	Grays, Chafford Hundred (A1306, west of Chafford Hundred Visitor Centre). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 5	Grays, Chafford Hundred and North Stifford (A13, A1306, Warren Terrace). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 7	West Thurrock (M25 north of the Dartford Crossing). Covers a hotel (IBIS).	2004	NO ₂ Annual Mean
AQMA 8	West Thurrock (M25 J31). Covers a hotel.	2004	NO ₂ Annual Mean
AQMA 9	West Thurrock / Aveley (M25 J31). Covers a hotel.	2004	NO ₂ Annual Mean
AQMA 10	Purfleet (London Road Purfleet, near to Jarrah Cottages). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 12	Purfleet (A1306 on the Watts Wood Estate). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 13	Purfleet / Aveley (A1306, London Road, Aveley Arterial Road). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 15	South Ockendon (M25 on the edge of Irvine Gardens). Covers one residential property.	2004	NO ₂ Annual Mean
AQMA 16	Near North Ockendon (M25 off Dennis Road). Covers one residential property.	2004	NO ₂ Annual Mean
AQMA 21	Purfleet (Stonehouse Lane). Covers a hotel.	2004	NO ₂ Annual Mean

AQMA	Location / Description	Date of Declaration	Pollutant (and Objective)
AQMA 23	West Thurrock (London Road West Thurrock). Covers an area encompassing residential properties.	2004	NO ₂ Annual Mean
AQMA 24	Tilbury (Calcutta Road, Dock Road, St Chads Road). Covers an area encompassing residential properties.	2012	NO ₂ Annual Mean
AQMA 25	Aveley (Aveley High Street and Ship Lane). Covers an area encompassing residential properties.	2016	NO ₂ Annual Mean
AQMA 26	Purfleet (Purfleet By-Pass). Covers an area encompassing residential properties.	2016	NO ₂ Annual Mean

- 8.2.4 With the exception of AQMA 24, AQMA 25 and AQMA 26, the February 2010 ES described all AQMAs. The February 2016 ES FID described AQMA 24 which was declared in 2014. Both AQMA 25 and AQMA 26 were declared in 2016, are over approximately 15 km from the Proposed Development site and are related to traffic / HGV pollution. Therefore, as previously described, all the AQMAs within the Thurrock Borough Council area are fairly small (lie along the routes of busy roads) and are primarily the result of road traffic.
- 8.2.5 In addition, as previously described, the other neighbouring local authorities (Basildon and Castlepoint) have not declared any AQMAs.

Ambient Air Quality Data

- 8.2.6 As with the February 2010 ES, the August 2014 ES FID and the February 2016 ES FID, the current state of the environment regarding ambient air quality has been determined via DEFRA's ambient air quality data.
- 8.2.7 DEFRA operates a number of automatic monitoring stations throughout the UK, and the results from these stations are freely available on the internet⁴¹. There are four such automatic monitoring stations, within DEFRA's Automatic Urban and Rural Monitoring Network (AURN), in the vicinity of the Proposed Development site and these stations have been in operation for a number of years. Therefore, as with the February 2010 ES, the August 2014 ES FID and the February 2016 ES FID, the current state of the environment regarding ambient air quality, has been determined using the data from these four stations.
- 8.2.8 Accordingly, for the years 2007 to 2018, Table 8.2 presents the annual average and maximum highest hourly average NO₂ concentrations for these four stations.

⁴¹ Available at:
<http://uk-air.defra.gov.uk/>

TABLE 8.2: ANNUAL AVERAGE AND MAXIMUM HIGHEST HOURLY AVERAGE NO₂ CONCENTRATIONS FOR THE AUTOMATIC MONITORING STATIONS (µg/m³)

	<i>Stanford-le-Hope</i>		<i>Rochester-Stoke</i>		<i>Thurrock</i>		<i>Southend-on-Sea</i>	
Type	Roadside		Rural		Urban Background		Urban Background	
Approximate Distance from Proposed Development site (km)	3.9		11.6		12.9		13.2	
Objective / Standard (µg/m³)	Annual 40 / Hourly 200							
	<i>Annual</i>	<i>Hourly</i>	<i>Annual</i>	<i>Hourly</i>	<i>Annual</i>	<i>Hourly</i>	<i>Annual</i>	<i>Hourly</i>
2018	27.6	110.2	13.0	76.0	24.8	103.2	18.8	81.8
2017	28.3	118.7	14.7	91.3	28.2	130.7	20.2	93.3
2016	26.9	140.7	13.3	111.2	27.9	148.3	20.5	125.9
2015	23.9	104.1	12.7	75.7	25.5	107.8	18.1	84.6
2014	26.2	140.1	14.4	89.9	26.5	129.5	19.4	99.9
2013	28.3	125.0	14.1	75.6	27.2	143.0	20.3	87.0
2012	33.0	145.0	18.2	90.3	28.7	143.0	23.9	99.0
2011	34.9	166.0	19.0	93.3	28.2	134.0	22.4	97.0
2010	35.4	164.0	19.2	66.1	29.3	138.0	16.0	113.0
2009	35.2	147.0	16.8	83.1	31.2	113.0	19.9	105.0
2008	37.2	168.0	17.8	88.1	32.0	164.0	22.8	111.0
2007	-	-	18.4	113.3	34.0	264.0	24.8	168.0

8.2.9 Furthermore, to assist local authorities in performing their duties in accordance with the Environment Act 1995, DEFRA also produces background maps⁴². Table 8.3 presents details of the average and maximum annual ground level NO₂ concentrations estimated for Thurrock Borough Council by DEFRA including projections for the years 2020, 2025 and 2030 (assuming 2017 as the base year). The projections for around 2025 are especially relevant given the current projected date for commercial operation. As can be seen from Table 8.3, the projections indicate an expected general improvement in ground level NO₂ concentrations over the coming years.

TABLE 8.3: AVERAGE AND MAXIMUM ANNUAL GROUND LEVEL NO₂ CONCENTRATIONS FOR THE YEARS 2020, 2025 AND 2030 (µg/m³)

<i>Pollutant</i>	<i>Year</i>	<i>Thurrock Borough Council</i>	
		<i>Average</i>	<i>Maximum</i>
Nitrogen Dioxide (NO ₂)	2017	20.0	35.8
	2020	18.0	33.3
	2025	15.7	30.7
	2030	14.4	29.3

DP World® London Gateway Monitoring

8.2.10 Following good practice, DP World® London Gateway is currently undertaking air quality monitoring to observe, control and manage construction related air quality impacts.

8.2.11 As part of this monitoring, a number of passive NO₂ diffusion tube monitors have been placed at various locations. In particular, there are two monitors located outside their LDO boundary, to the west of the GEC site, one representative of a roadside location and one representative of an urban background / rural location. For these monitors, 2018 results indicate that the measured ambient air quality is stable, with concentrations similar to those measured by the DEFRA AURN monitors for roadside and urban background / rural locations.

Summary

8.2.12 The current state of the environment regarding air quality is materially the same as that previously described.

8.3 Likely Significant Effects Previously Described

Construction / Decommissioning

8.3.1 The likely direct effects previously described include those due to:

- Dust-generating construction works, including:
 - Earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow; and,
 - Vehicle movements.
- Emissions from construction plant / equipment / vehicles;
- Unplanned releases / spills.

Operation

8.3.2 The likely direct effects previously described include those due to:

- NO_x emissions from the Proposed Development (the CCGT unit(s) or the CCGT unit and OCGT unit(s))⁴³; and

⁴² Available at: <https://uk-air.defra.gov.uk/data/lagm-background-home>

⁴³ The CCGT unit(s) and the OCGT unit(s) will burn natural gas only, which is an inherently clean fuel and does not produce the SO₂ or PM emissions associated with burning coal. As a result, all atmospheric emissions from the Proposed Development will be controlled at source and no flue gas cleaning equipment is required.

- Unplanned releases / spills.

8.4 Main Respects in which the Likely Significant Effects will Differ

- 8.4.1 Table 8.5 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on air quality will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 8.5: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT EFFECTS ON AIR QUALITY WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>		
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>		
Will the Proposed Development release pollutants or any hazardous / toxic / noxious substances to air which differ from those previously described?	N	Whilst construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described. Similarly, during decommissioning, the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described.	N	N / A
	N	During operation: <ul style="list-style-type: none"> Under Development Option (i), the CCGT unit(s) will not release any pollutants or substances to air which materially differ from those previously described. Under Development Option (ii), there will be no emissions from the BESS, the CCGT unit and OCGT unit(s) will not release any pollutants or substances to air which materially differ from those previously described. 	N	N / A

Potential for the Likely Significant Effects on the Environment to Differ		Is there a Need for Further Assessment?	
Question:	Y / N (Briefly Describe)	Y / N (Briefly Describe)	
<p>Are there any:</p> <ul style="list-style-type: none"> • Areas on or around the site which are already subject to pollution / environmental damage (e.g. where environmental standards are exceeded); and / or, • Land uses on or around the site (e.g. homes / gardens / private property / industry / commerce / recreation / public open space / community facilities / agriculture / forestry / tourism / mining or quarrying); and / or, • Areas on or around the site which are occupied by sensitive land uses (e.g. hospitals / schools / places of worship / community facilities); and / or, • Areas on or around the site which are densely populated / built-up; <p>which could be affected by the Proposed Development in a way which differs from that previously described?</p>	N	The current state of the environment regarding air quality is materially the same as that previously described, and the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described.	N N / A

8.5 Need for an Updated Impact Assessment

Construction / Decommissioning

- 8.5.1 The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described.
- 8.5.2 Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on air quality will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

Operation

- 8.5.3 The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described.
- 8.5.4 Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on air quality will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

8.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 8.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on air quality.

9. NOISE AND VIBRATION

9.1 Introduction

9.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding noise and vibration;
- The likely significant direct and indirect / secondary noise and vibration effects of the Proposed Development previously described; and,
- The main respects in which the likely significant direct and indirect / secondary noise and vibration effects of the Proposed Development will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

9.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant noise and vibration effects.

9.1.3 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

9.2 Current State of the Environment (Baseline Scenario)

Basis

9.2.1 The current state of the environment regarding noise and vibration is based on:

- Previous surveys, including:
 - The 2010 Baseline Noise Survey undertaken to inform the February 2010 ES (with measurements taken between 27 and 28 January 2010); and,
 - The 2016 Updated Baseline Noise Survey undertaken to inform the February 2010 ES FID (with measurements taken between 5 and 7 January 2016); and,
- Information from DP World® London Gateway's ambient noise monitoring.

Previous Surveys

9.2.2 The previous surveys were carried out in accordance with the requirements of:

- BS 7445 ('Description and Measurement of Environmental Noise' (Parts 1 to 3));
- For the 2010 Baseline Noise Survey, BS 4142 (1997) ('Methods for Rating Industrial Noise affecting Mixed Residential and Industrial Areas'); and,
- For the 2016 Updated Baseline Noise Survey, BS 4142 (2014) ('Methods for Rating and Assessing Industrial and Commercial Sound').

Noise Sensitive Receptors

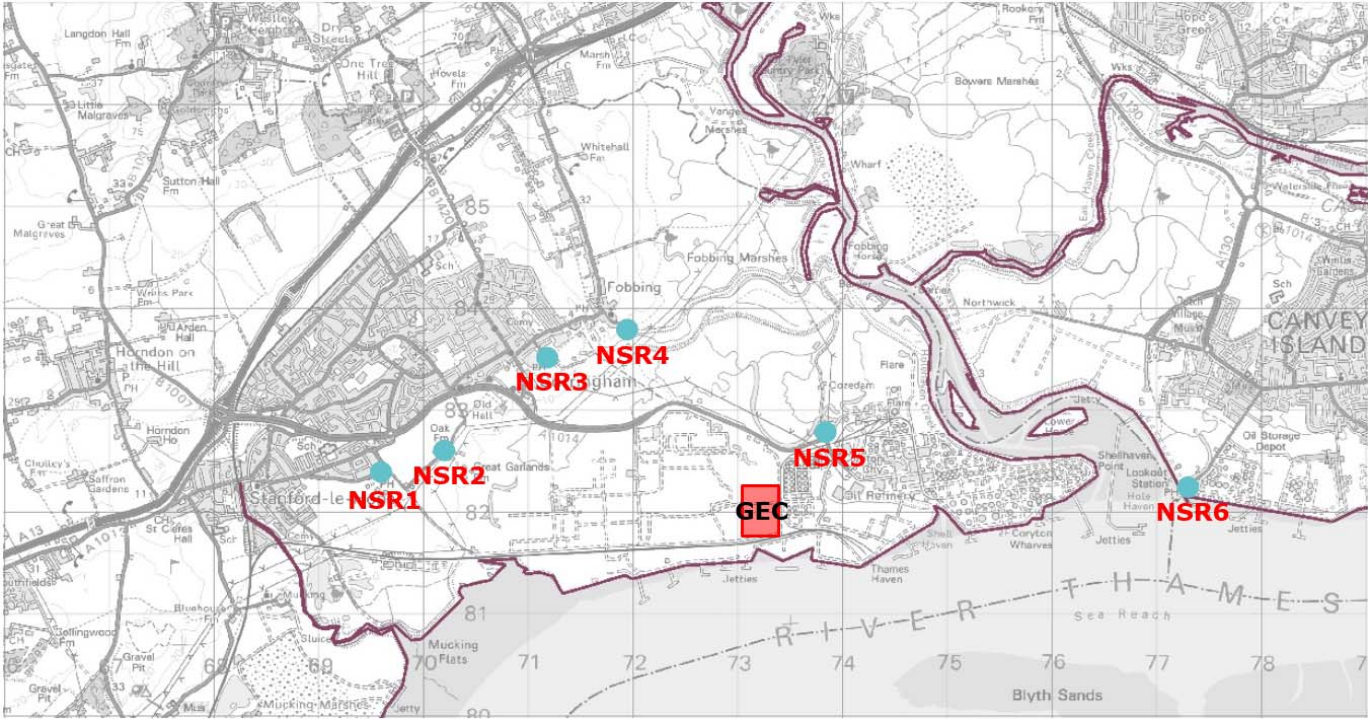
9.2.3 For the 2010 Baseline Noise Survey and the 2016 Updated Baseline Noise Survey, measurements were taken during daytime and night-time periods at six Noise Sensitive Receptor (NSR) locations. Table 9.1 and Insert 9.1 identifies these NSR locations.

**TABLE 9.1: 2010 BASELINE NOISE SURVEY / 2016 UPDATED BASELINE NOISE SURVEY
NSR LOCATIONS (AND ASSOCIATED COORDINATES)**

<i>NSR Location</i>		<i>Approximate Distance to Proposed Development Site (km)</i>	<i>2010 Baseline Noise Survey</i>		<i>2016 Updated Baseline Noise Survey</i>		<i>Approximate Difference in NSR Location (m)</i>
			<i>E</i>	<i>N</i>	<i>E</i>	<i>N</i>	
1	Corner of Billet Lane and Rainbow Lane, Stanford-le-Hope	3.6	569601	182396	569630	182455	65
2	Oak Farm, High Road, Stanford-le-Hope	3.1	570197	182606	570241	182661	70
3	Corringham Primary School, Herd Lane, Corringham	2.5	571184	183516	571196	183497	25
4	End of Wharf Road, Corringham	2.2	571945	183792	571977	183802	35
5	Start of Track to Oozedam Farm, A1014 (The Manorway)	1.1	573835	182782	573825	182782	10
6	'New Residential Development', Haven Road, Canvey Island	4.1	577300	182242	577354	182286	70

**INSERT 9.1: 2010 BASELINE NOISE SURVEY / 2016 UPDATED BASELINE NOISE SURVEY
APPROXIMATE NSR LOCATIONS**

Insert shows 2016 Updated Baseline Noise Survey NSR Locations



[Significant Noise Sources](#)

- 9.2.4 Table 9.2 presents a comparison of the significant noise sources at the different NSR locations noted in the 2010 Baseline Noise Survey and the 2016 Updated Baseline Noise Survey.

[Measured Noise Levels](#)

- 9.2.5 Table 9.3 presents a comparison of the measured noise levels at the different NSR locations noted in the 2010 Baseline Noise Survey and the 2016 Updated Baseline Noise Survey.

TABLE 9.2: COMPARISON OF SIGNIFICANT NOISE SOURCES AT THE NSR LOCATIONS

<i>NSR Location</i>		<i>2010 Baseline Noise Survey</i>	<i>2016 Updated Baseline Noise Survey</i>
1	Corner of Billet Lane and Rainbow Lane, Stanford-le-Hope	Noise climate characterised by: aircraft; birds; piling (at a distance); and, traffic (both local and at a distance).	The dominant source of noise was traffic on the A1014 (The Manorway). Other sources included: aircraft; and, traffic on the A13 and Rainbow Lane.
2	Oak Farm, High Road, Stanford-le-Hope	Noise climate characterised by: aircraft (both light and jet); helicopter; industrial noise; overhead power lines; and, traffic on the A1014 (The Manorway).	The dominant source of noise was electric crackle from the overhead power lines. Other sources included: industrial activity (including that at the DP World® London Gateway Port and DP World® London Gateway Logistics Park sites); traffic on the A1014 (The Manorway); and, wind.
3	Corringham Primary School, Herd Lane, Corringham	Noise climate characterised by: aircraft; piling (at a distance); school noise; and, traffic (both local and at a distance).	The dominant source of noise was industrial activity (including that at the DP World® London Gateway Port and DP World® London Gateway Logistics Park sites). Other sources included: aircraft; and, traffic on the A1014 (The Manorway) and A13.
4	End of Wharf Road, Corringham	Noise climate characterised by: aircraft (both light and jet); birds; dogs barking; traffic (both local and at a distance); and, wind.	The dominant source of noise was industrial activity (including that at the DP World® London Gateway Port and DP World® London Gateway Logistics Park sites). Other sources included: aircraft; and, traffic on the A1014 (The Manorway).
5	Start of Track to Oozedam Farm, A1014 (The Manorway)	Noise climate characterised by: aircraft; industrial noise; piling; and, traffic (local Heavy Goods Vehicle (HGV) movements).	The dominant source of noise was industrial activity and traffic on the A1014 (The Manorway). Other sources included: aircraft; and, industrial activity (including that at the DP World® London Gateway Port and DP World® London Gateway Logistics Park sites).
6	'New Residential Development', Haven Road, Canvey Island	Noise climate characterised by: aircraft; birds; conversations; poling; traffic (both local and at a distance).	The dominant source of noise was the Lobster Smack Pub. Other sources included: aircraft; birds (seagulls); and traffic on Haven Road.

TABLE 9.3: COMPARISON OF MEASURED NOISE LEVELS AT THE NSR LOCATIONS

<i>NSR Location</i>		<i>Period</i>	<i>2010 Baseline Noise Survey Lowest Reported L_{A90,T^3} (dB)</i>	<i>2016 Updated Baseline Noise Survey Lowest Reported L_{A90,T^3} (dB)</i>	<i>Difference in Lowest Reported $L_{A90,T}$ (dB)</i>
1	Corner of Billet Lane and Rainbow Lane, Stanford-le-Hope	Daytime ¹	44	44	0
		Night-time ²	41	39	-2
2	Oak Farm, High Road, Stanford-le-Hope	Daytime	45	47	+2
		Night-time	37	44	+8
3	Corringham Primary School, Herd Lane, Corringham	Daytime	45	40	-5
		Night-time	37	40	+3
4	End of Wharf Road, Corringham	Daytime	38	36	-2
		Night-time	31	34	+3
5	Start of Track to Oozedam Farm, A1014 (The Manorway)	Daytime	54	36	-18
		Night-time	38	34	-4
6	'New Residential Development', Haven Road, Canvey Island	Daytime	43	43	0
		Night-time	38	34	-4

¹ Daytime period taken to be 07:00 – 23:00.

² Night-time period taken to be 23:00 – 07:00.

³ As per BS 4142 where long-term measurements were taken, the lowest reported $L_{A,90}$ is the modal value determined via statistical analysis. Where short-term measurements were taken, the lowest reported $L_{A,90}$ is the lowest measured $L_{A,90}$.

9.2.6 [Summary](#)

9.2.7 The difference in the lowest reported $L_{A,90}$ measurements between the 2010 Baseline Noise Survey and the 2016 Updated Baseline Noise Survey show that, whilst there have been some minor changes, the ambient background noise baseline at the different NSR locations is stable. Indeed, the minor changes are representative of expected variations due to differing measurement conditions (e.g. time, meteorology).

DP World® London Gateway Monitoring

9.2.8 Under condition of their LDO, DP World® London Gateway is currently undertaking noise monitoring to observe, control and manage construction related noise impacts.

9.2.9 As part of this monitoring, a number of noise monitors have been placed at various locations within a 'buffer zone' surrounding the boundary of the LDO. For these monitors, 2018 results indicate that the measured ambient background noise baseline is stable, and that there have been no exceedances of the allowable limits due to construction activities.

Summary

9.2.10 The current state of the environment regarding noise and vibration is materially the same as that previously described.

9.3 Likely Significant Effects Previously Described

Construction / Decommissioning

9.3.1 The likely direct effects previously described include those due to:

- Noise and vibration-generating construction works, including: earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow;
- Noise and vibration-generating construction plant / equipment / vehicles.

Operation

9.3.2 The likely direct effects previously described include those due to:

- Noise and vibration-generating plant within the Proposed Development (the CCGT unit(s) or the CCGT unit and OCGT unit(s)).

9.4 Main Respects in which the Likely Significant Effects will Differ

9.4.1 Table 9.4 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary noise and vibration effects of the Proposed Development will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 9.4: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT NOISE AND VIBRATION EFFECTS WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>		
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>		
Will the Proposed Development cause noise and vibration which differs from that previously described?	N	Whilst construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the Proposed Development will not cause noise and vibration that materially differs from that previously described. Similarly, during decommissioning, the Proposed Development will not cause noise and vibration that materially differs from that previously described.	N	N / A
	N	During operation: <ul style="list-style-type: none"> Under Development Option (i), the CCGT unit(s) will not cause noise and vibration that materially differs from that previously described. Under Development Option (ii), whilst there will be some minor noise emissions from the BESS, the CCGT unit and the OCGT unit(s) remain the major noise emitters. Therefore, the Proposed Development will not cause noise and vibration that materially differs from that previously described. 	N	N / A

Potential for the Likely Significant Effects on the Environment to Differ		Is there a Need for Further Assessment?	
Question:	Y / N (Briefly Describe)	Y / N (Briefly Describe)	
<p>Are there any:</p> <ul style="list-style-type: none"> • Areas on or around the site which are already subject to pollution / environmental damage (e.g. where environmental standards are exceeded); and / or, • Land uses on or around the site (e.g. homes / gardens / private property / industry / commerce / recreation / public open space / community facilities / agriculture / forestry / tourism / mining or quarrying); and / or, • Areas on or around the site which are occupied by sensitive land uses (e.g. hospitals / schools / places of worship / community facilities); and / or, • Areas on or around the site which are densely populated / built-up; <p>which could be affected by the Proposed Development in a way which differs from that previously described?</p>	N	The current state of the environment regarding noise and vibration is materially the same as that previously described, and the Proposed Development will not cause noise and vibration that materially differs from that previously described.	N N / A

9.5 Need for an Updated Impact Assessment

Construction / Decommissioning

- 9.5.1 The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not cause noise and vibration that materially differs from that previously described.
- 9.5.2 Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary noise and vibration effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

Operation

- 9.5.3 The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not cause noise and vibration that materially differs from that previously described.
- 9.5.4 Therefore, during operation, the likely significant direct and indirect / secondary noise and vibration effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

9.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 9.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant noise and vibration effects.

10. LANDSCAPE AND VISUAL

10.1 Introduction

10.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding landscape and visual;
- The likely significant direct and indirect / secondary landscape and visual effects of the Proposed Development previously described; and,
- The main respects in which the likely significant direct and indirect / secondary landscape and visual effects of the Proposed Development will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

10.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant landscape and visual effects.

10.1.3 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

10.2 Current State of the Environment (Baseline Scenario)

Baseline Scenario Assumed Previously

10.2.1 The baseline scenario assumed previously with regards to landscape and visual includes that:

- The Proposed Development will be located within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent);
- The overall red-line boundary, and the GEC site, will be located on the north bank of the Thames Estuary on land within the DP World® London Gateway Logistics Park, to the north of the DP World® London Gateway Port; and,
- As part of the agreement between GECL and DP World®, in advance of any construction works, the GEC site will be cleared, remediated and levelled, and provided to GECL in a condition that would allow for construction of the Proposed Development.

Baseline Scenario Assumptions Previously Described

10.2.2 Within the February 2010 ES it was noted that:

- The DP World® London Gateway sites were in the early stages of construction. However, the February 2010 ES photomontages did not include the DP World® London Gateway sites.

10.2.3 Within the December 2010 ES FID it was noted that:

- Within Thurrock Borough Council's consultation response it was stated that: "[the] *London Gateway Development (LGD) is not developed as presented and illustrated in the supporting [February 2010 ES] photomontages [...]. [The] London Gateway Logistics Park and DP World Deep Sea Port are major developments scheduled for the area. There is sufficient detail in the public realm to establish a future baseline*".
- Subsequently, the December 2010 ES FID additional photomontages did include the DP World® London Gateway sites. Further, the December 2010 ES FID updated Landscape and Visual Impact Assessment considered the likely effects of the Proposed Development against a baseline scenario including operational DP World® London Gateway sites.

10.2.4 Within the August 2014 ES FID it was noted that:

- With regards to the on-going construction and build-out of the DP World® London Gateway sites, the clearance, levelling and remediation works had commenced and would continue in accordance with a programme and in a manner that supports the on-going development. In particular, approximately 80% of the locations across the DP World® London Gateway sites which were known to require remediation had been successfully remediated.
- In addition, significant ground preparation works had been undertaken across the DP World® London Gateway sites such that they largely comprised bare ground.

10.2.5 Within the February 2016 ES FID it was noted that:

- With regards to the on-going construction and build-out of the DP World® London Gateway sites, a site visit was undertaken in January 2016. The site visit noted that, despite the on-going construction and build-out, the landscape and visual receptor sensitivity was materially the same as that previously described.

10.2.6 At the time of writing this 2019 ES FID, it is noted that construction and build-out of the DP World® London Gateway sites continues, with approximately 113099 m² of Logistics Park 'B'-Class floor space and three Port berths currently operational. A further 41575 m² of Logistics Park 'B'-Class floor space and remaining three Port berths remain authorised, and will be delivered subject to commercial demand. Additional clearance, levelling and remediation continues in a manner to support this on-going development.

10.2.7 As noted in the August 2014 ES FID, it is also understood from DP World® that, within the Logistics Park and Port, development of an individual plot would only commence once it had been successfully cleared and remediated.

Summary

10.2.8 Whilst there have been some changes to the state of the environment, such changes were considered within the baseline scenario assumed previously. These changes included the on-going construction and build-out of the DP World® London Gateway sites.

10.2.9 Accordingly, the current baseline scenario regarding landscape and visual (i.e. operational DP World® London Gateway sites) is materially the same as that assumed previously.

10.3 Likely Significant Effects Previously Described

Construction / Decommissioning

10.3.1 The likely direct effects previously described include those due to:

- Construction works, including: earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow;
- The presence of construction plant / equipment / vehicles; and,
- The use of lighting to ensure that the construction personnel can move around the Proposed Development site safely during the hours of darkness.

Operation

10.3.2 The likely direct effects previously described are those due to:

- The presence of the Proposed Development.

10.4 Main Respects in which the Likely Significant Effects will Differ

10.4.1 Table 10.1 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary landscape and visual effects of the Proposed Development will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 10.1: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT LANDSCAPE AND VISUAL EFFECTS WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment? Y / N (Briefly Describe)</i>		
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>			
Do the structures associated with the Proposed Development differ from those previously described?	N	Whilst the construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the structures associated with construction of the Proposed Development (e.g. the construction plant / equipment / vehicles) will not materially differ from those previously described. Similarly, during decommissioning, the structures associated with decommissioning of the Proposed Development will not materially differ from those previously described.	N	N / A
	Y	During operation: <ul style="list-style-type: none"> Under Development Option (i), the structures associated with the CCGT unit(s) will not differ from those previously described. Under Development Option (ii), whilst the structures associated with the CCGT unit and the OCGT units(s) will not differ from those previously described, there will also be structures associated with the BESS which will differ from those previously described. 	N	The February 2010 ES included a Parameter Block Model Layout ⁴⁴ . The December 2010 ES FID, August 2014 ES FID and February 2016 ES FID subsequently referenced this Parameter Block Model Layout. Within the February 2010 ES (and the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID), the basis for assessment of the likely significant effects is that the Proposed Development is located wholly within the limits of the Parameter Block Model Layout. Whilst there may be some additional structures and some re-location of items of plant / equipment, both Development Option (i) and Development Option (ii) remain wholly located within the limits of the Parameter Block Model Layout.
Will the Proposed Development cause the release of light which differs from that previously described?	N	The Proposed Development will not cause the release of light which materially differs from that previously described.	N	N / A

⁴⁴ Included in: 'Environmental Statement Volume 3 (Figures)' (Parsons Brinckerhoff, February 2010). Figure 4.3 'Proposed Indicative Layout / Parameter Block Model Layout'.

Potential for the Likely Significant Effects on the Environment to Differ		Is there a Need for Further Assessment?	
Question:	Y / N (Briefly Describe)	Y / N (Briefly Describe)	
Is the Proposed Development located in an area which differs from that previously described?	N The Proposed Development will be located within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent). The overall red-line boundary, and the GEC site, will be located on the north bank of the Thames Estuary on land within the DP World® London Gateway Logistics Park, to the north of the DP World® London Gateway Port. Condition (2) of the 2016 Deemed Planning Permission requires the Proposed Development to be located within the overall red-line boundary. The 2019 Variation Application does not seek to vary this Condition.	N	N / A
Is the Proposed Development in a location where it is likely to be highly visible to people in a way which materially differs from that previously described?	N The Proposed Development will be located within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent). Condition (2) of the 2016 Deemed Planning Permission requires the Proposed Development to be located within the overall red-line boundary. The 2019 Variation Application does not seek to vary this Condition. In addition: <ul style="list-style-type: none"> • During construction / decommissioning, the structures associated with the Proposed Development will not materially differ from those previously described. • During operation, both Development Option (i) and Development Option (ii) remain wholly located within the limits of the Parameter Block Model Layout. 	N	N / A

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>	
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>	
Are there any: <ul style="list-style-type: none"> • Areas on or around the site which are protected under international / national / local legislation for their landscape value; and / or, • Areas or features of high landscape / scenic value on or around the site; which could be affected by the Proposed Development in a way which differs from that previously described?	N	The current baseline scenario with regards to landscape and visual is materially the same as that assumed previously, and likely landscape and visual effects of the Proposed Development are materially the same as those previously described.	N N / A

10.5 Need for an Updated Impact Assessment

Construction / Decommissioning

- 10.5.1 The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described.
- 10.5.2 Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary landscape and visual effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

Operation

- 10.5.3 The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described.
- 10.5.4 Therefore, during operation, the likely significant direct and indirect / secondary landscape and visual effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

10.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 10.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant landscape and visual effects.

11. ECOLOGY

11.1 Introduction

11.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding ecology;
- The likely significant direct and indirect / secondary effects of the Proposed Development on ecology previously described; and,
- The main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on ecology will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

11.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on ecology.

11.1.3 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

11.2 Current State of the Environment (Baseline Scenario)

Baseline Scenario Assumed Previously

11.2.1 The baseline scenario assumed previously with regards to ecology includes that:

- For 'on-site' ecological receptors, as part of the agreement between GECL and DP World®, in advance of any construction works, the GEC site will be cleared, remediated, and levelled, and provided to GECL in a condition that would allow for construction of the Proposed Development.
- For 'off-site' ecological receptors, the only receptors considered would be the statutory ecological designated sites.

Baseline Scenario Assumptions Previously Described

'On-Site' Ecological Receptors

11.2.2 Within the February 2010 ES it was noted that:

- The GEC site would be cleared, remediated and levelled, and provided to GECL in a condition that would allow for the construction of the Proposed Development. Therefore, the baseline for the Proposed Development site comprises bare earth and hardstanding, devoid of vegetation. Overall, the GEC site would be of negligible value for all habitat and species.

11.2.3 Within the August 2014 ES FID it was noted that:

- With regards to the on-going construction and build-out of the DP World® London Gateway sites, the clearance, levelling and remediation works had commenced and would continue in accordance with a programme and in a manner that supports the on-going development. In particular, these works included the ecological clearance of the Proposed Development site under the ecological mitigation and compensation works required for the DP World® London Gateway sites. The ecological clearance included the licenced translocation of protected species (including adders, Great Crested Newts (GCN) and water voles) to nearby receptor sites.
- In addition, significant ground preparation works had been undertaken across the DP World® London Gateway sites such that they largely comprised bare ground.

11.2.4 Within the February 2016 ES FID it was noted that:

- With regards to the on-going construction and build-out of the DP World® London Gateway sites, additional licenced trapping and translocation had been undertaken for GCN and water voles.

- 11.2.5 At the time of writing this 2019 ES FID, it is noted that construction and build-out of the DP World® London Gateway sites continues. Additional licenced trapping and translocation continues in a manner to support this on-going development.
- 11.2.6 As noted in the August 2014 ES FID, it is also understood from DP World® that, within the Logistics Park and Port, development of an individual plot would only commence once it had been successfully cleared and remediated.

[‘Off-Site’ Ecological Receptors](#)

- 11.2.7 Within the February 2010 ES it was noted that:
- The only receptors considered would be the statutory ecological designated sites.
- 11.2.8 Accordingly, Table 11.1 summarises the statutory designated sites within 10 km of the Proposed Development site.

TABLE 11.1: STATUTORY ECOLOGICAL DESIGNATED SITES WITHIN 10 KM OF THE PROPOSED DEVELOPMENT SITE

<i>Site</i>	<i>Distance from the GEC Site (km)</i>	<i>Date of Designation</i>
Thames Estuary and Marshes SPA / Thames Estuary and Marshes Ramsar Site	2 km South	31/03/2000
Benfleet and Southend Marshes SPA / Benfleet and Southend Ramsar Site	6.5 km North East	14/02/1994
South Thames Estuary and Marshes SSSI	2 km South	24/12/1991
Benfleet and Southend SSSI	6.5 km North East	01/05/1987
Vange and Fobbing Marshes SSSI	1.5 km North	06/01/1988
Holehaven Creek SSSI	2 km North East	28/03/2003
Mucking Flats and Marshes SSSI	2 km South West	18/09/1991
Canvey Wick SSSI	3 km North East	11/02/2005
Pitsea Marsh SSSI	4 km North	01/02/1987
Langdon Ridge SSSI	5 km North East	29/06/2018
Basildon Meadows SSSI	5.5 km North West	01/02/1985
Northward Hill SSSI	7 km South East	23/10/1984
Chattenden Woods and Lodge Hill SSSI ⁴⁵	8 km South	Originally 1984, Updated 13/03/2013
Dalham Farm (Geological) SSSI	8 km South East	29/05/1987
Thundersley Great Common SSSI	10 km North East	01/10/1987
High Halstow National Nature Reserve (NNR)	7 km South East	-
Leigh NNR	9.5 km North East	-
Grove House Wood Local Nature Reserve (LNR)	4.5 km West	-

⁴⁵ Previously Chattenden Woods SSSI. Extended to include Lodge Hill site.

<i>Site</i>	<i>Distance from the GEC Site (km)</i>	<i>Date of Designation</i>
Vange Hill LNR	6 km North West	-
Linford Wood LNR	6 km South West	-
Canvey Lake LNR	6.5 km North East	-
Belton Hills LNR	10 km North East	-

11.2.9 With the exception of Langdon Ridge SSSI, the February 2010 ES described all statutory ecological designated sites. Langdon Ridge SSSI was declared in 2018 but no information on the baseline air quality and deposition is available for this site.

11.2.10 In addition:

- As noted in Section 8 (Air Quality), the current state of the environment regarding air quality is materially the same as that previously described.
- As noted in Section 9 (Noise and Vibration), the current state of the environment regarding noise and vibration is materially the same as that previously described.

Summary

11.2.11 Regarding on-site ecological receptors, whilst there have been some changes to the state of the environment, such changes were considered within the baseline scenario assumed previously. These changes included the on-going construction and build-out of the DP World® London Gateway sites.

11.2.12 Regarding off-site ecological receptors, with one exception, there have been no changes to the statutory ecological designated sites and the current state of the environment regarding air quality / noise and vibration is materially the same as that previously described.

11.2.13 Accordingly, the current baseline scenario regarding ecology is materially the same as that assumed previously.

11.3 Likely Significant Effects Previously Described

Construction / Decommissioning

11.3.1 The likely effects previously described include those due to:

- Direct effects, comprising:
 - Habitat loss, fragmentation, degradation, damage and / or disturbance; and,
 - Species mortality, injury and / or disturbance.
- Indirect / secondary effects, comprising:
 - Those related to air quality, in particular dust-generating construction works;
 - Those related to noise and vibration;
 - Those related to landscape and visual, in particular use of lighting;
 - Those related to discharges of pollutants to land and / or water; and,
 - Those related to unplanned releases / spills to air, land and / or water.

Operation

11.3.2 The likely effects previously described include:

- Indirect / secondary effects, comprising:
 - Those related to air quality, in particular NO_x emissions from the Proposed Development (the CCGT unit(s) or the CCGT unit and the OCGT unit(s));

- Those related to noise and vibration-generating plant within the Proposed Development (the CCGT unit(s) or the CCGT unit and the OCGT unit(s));
- Those related specifically to landscape and visual, in particular the use of lighting; and,
- Those related to unplanned emissions / releases / spills to air, land or water.

11.4 Main Respects in which the Likely Significant Effects will Differ

- 11.4.1 Table 11.2 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on ecology will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 11.2: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT EFFECTS ON ECOLGY WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>		
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>		
<p>Are there any:</p> <ul style="list-style-type: none"> • Areas on or around the site which are protected under international / national / local legislation for their ecological value; and / or, • Other areas on or around the site which are important / sensitive for reasons of their ecology (e.g. wetlands / watercourses / other water bodies / coastal zone / mountains / forests or woodlands); and / or, • Areas on or around the site which are used by protected / important / sensitive species of fauna or flora (e.g. for breeding / nesting / foraging / resting / overwintering / migration); <p>which could be affected by the Proposed Development in a way which differs from that previously described?</p>	<p>N</p>	<p>The current baseline scenario is materially the same as that assumed previously.</p> <p>In addition:</p> <ul style="list-style-type: none"> • In terms of air quality, the Proposed Development will not release any pollutants or substances to air which materially differ from those previously described (also see Section 8 (Air Quality)); • In terms of noise and vibration, the Proposed Development will not cause noise and vibration that materially differs from that previously described (also see Section 9 (Noise and Vibration)); • In terms of lighting, the Proposed Development will not cause the release of light which materially differs from that previously described (also see Section 10 (Landscape and Visual)); • In terms of ground conditions, the Proposed Development will not lead to risks of contamination of land which materially differs from that previously described (also see Section 12 (Ground Conditions: Geology and Land Contamination)); and, • In terms of water resources, the Proposed Development will not lead to risks of contamination of water which materially differs from that previously described (also see Section 13 (Water Resources and Flood Risk)). <p>Therefore, the likely effects of the Proposed Development on ecology are materially the same as those previously described.</p>	<p>N</p>	<p>N / A</p>

11.5 Need for an Updated Impact Assessment

Construction / Decommissioning

- 11.5.1 The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described.
- 11.5.2 Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on ecology will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

Operation

- 11.5.3 The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described.
- 11.5.4 Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on ecology will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

11.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 11.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on ecology.

12. GROUND CONDITIONS: GEOLOGY AND LAND CONTAMINATION

12.1 Introduction

12.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding ground conditions (geology and land contamination);
- The likely significant direct and indirect / secondary effects of the Proposed Development on ground conditions (geology and land contamination) previously described; and,
- The main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on ground conditions (geology and land contamination) will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

12.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on ground conditions (geology and land contamination).

12.1.3 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

12.2 Current State of the Environment (Baseline Scenario)

Baseline Scenario Assumed Previously

12.2.1 The baseline scenario assumed previously with regards to ground conditions (geology and land contamination) includes that:

- The Proposed Development will be located within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent).
- The overall red-line boundary, and the GEC site, will be located on the north bank of the Thames Estuary on land within the DP World® London Gateway Logistics Park, to the north of the DP World® London Gateway Port.
- As part of the agreement between GECL and DP World®, in advance of any construction works, the GEC site will be cleared, remediated and levelled, and provided to GECL in a condition that would allow for construction of the Proposed Development.

Baseline Scenario Assumptions Previously Described

12.2.2 Within the February 2010 ES it was noted that:

- The GEC site would be cleared, remediated and levelled, and provided to GECL in a condition that would allow for the construction of the Proposed Development. Therefore, the baseline for the Proposed Development site comprises bare earth and hardstanding.
- In addition, following clearance, remediation and levelling, it is not anticipated that there would be any contamination of the Proposed Development site, therefore breaking potential pollutant linkages in the Conceptual Site Model.

12.2.3 Within the December 2010 ES FID it was noted that:

- Following the clearance, remediation and levelling, 'Remediation Validation Reports' would be produced as documentation of the works. These would support the future land use of the Proposed Development site relating to energy / electricity generation.
- In addition, it was also noted that it was considered prudent that further independent testing was undertaken prior to commencement to confirm that the

Proposed Development site was suitable for a land use relating to energy / electricity generation, and ensure that any issues associated with any hotspots could be addressed.

- 12.2.4 Subsequently, the Conditions of the 2011 Deemed Planning Permission (associated with the Original Consent) provided that:
- (at Condition (45)) the commencement of the Proposed Development not take place until a scheme to deal with the risks associated with the contamination of the site has been submitted to and approved in writing by Thurrock Borough Council.
 - (at Condition (47)) the commencement of the Proposed Development not take place until a Verification Report (detailing any additional remediation) for the site has been submitted to and approved in writing by Thurrock Borough Council.
 - (at Condition (49)) that, in the event of contamination being found that was not previously identified, works on that part of the site cease, be reported and only re-commence following submission of a scheme to deal with the associated risks.
- 12.2.5 These Conditions were retained within the 2014 Deemed Planning Permission (associated with the 2014 Varied Consent) and the 2016 Deemed Planning Permission (associated with the 2016 Varied Consent). Whilst the 2019 Variation Application seeks vary these Conditions to required that commencement of a specified phase of the Proposed Development not take place until schemes / Reports associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council, the overall provisions of these Conditions will be retained.
- 12.2.6 Within the August 2014 ES FID it was noted that:
- With regards to the on-going construction and build-out of the DP World® London Gateway sites, the clearance, levelling and remediation works had commenced and would continue in accordance with a programme and in a manner that supports the on-going development. In particular, approximately 80% of the locations across the DP World® London Gateway sites which were known to require remediation had been successfully remediated.
 - In addition, significant ground preparation works had been undertaken across the DP World® London Gateway sites such that they largely comprised bare ground.
- 12.2.7 At the time of writing this 2019 ES FID, it is noted that construction and build-out of the DP World® London Gateway sites continues, with approximately 113099 m² of Logistics Park 'B'-Class floor space and three Port berths currently operational. A further 41575 m² of Logistics Park 'B'-Class floor space and remaining three Port berths remain authorised, and will be delivered subject to commercial demand. Additional clearance, levelling and remediation continues in a manner to support this on-going development.
- 12.2.8 As noted in the August 2014 ES FID, it is also understood from DP World® that, within the Logistics Park and Port, development of an individual plot would only commence once it had been successfully cleared and remediated.

Summary

- 12.2.9 Whilst there have been some changes to the state of the environment, such changes were considered within the baseline scenario previously assumed. These changes included the on-going construction and build-out of the DP World® London Gateway sites.
- 12.2.10 Accordingly, the current baseline scenario regarding ground conditions (geology and land contamination) (i.e. operational DP World® London Gateway sites) is materially the same as that assumed previously.

12.3 Likely Significant Effects Previously Described

Construction / Decommissioning

- 12.3.1 The likely direct effects previously described include those due to:
- Release of contaminants due to construction activities across the Proposed Development site;

- Discharges of pollutants to land; and,
- Unplanned releases / spills.

Operation

12.3.2 The likely direct effects previously described include:

- Presence of the Proposed Development; and,
- Unplanned emissions / releases / spills.

12.4 Main Respects in which the Likely Significant Effects will Differ

12.4.1 Table 12.1 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on ground conditions (geology and land contamination) will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 12.1: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT EFFECTS ON GROUND CONDITIONS (GEOLOGY AND LAND CONTAMINATION) WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>	
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>	
Will the Proposed Development lead to risks of contamination of land from releases of pollutants onto the ground which differ from those previously described?	N The Proposed Development will not lead to risks of contamination of land which materially differs from that previously described.	N	N / A
Will construction / operation / decommissioning of the Proposed Development involve actions which will cause physical changes in the locality (i.e. land use / topography) which differ from those previously described?	N Whilst the construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the construction of the Proposed Development will not involve actions which will cause physical changes in the locality (i.e. land use / topography) which will materially differ from those previously described. Similarly, the operation / decommissioning of the Proposed Development will not involve actions which will cause physical changes in the locality (i.e. land use / topography) which will materially differ from those previously described. Furthermore, with regards to flood risk, the 2019 Updated Flood Risk Assessment did not identify a requirement to alter the proposed finished floor levels from the current minimum of 3.7 m AOD.	N	N / A
Are there: <ul style="list-style-type: none"> • Existing land uses; and / or, • Any plans for future land uses; on or around the site which could be affected by the Proposed Development in a way which differs from that previously described?	N The Proposed Development will be located within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent). The overall red-line boundary, and the GEC site, will be located on the north bank of the Thames Estuary on land within the DP World® London Gateway Logistics Park, to the north of the DP World® London Gateway Port. Condition (2) of the 2016 Deemed Planning Permission requires the Proposed Development to be located within the overall red-line boundary. The 2019 Variation Application does not seek to vary this Condition.	N	N / A

Potential for the Likely Significant Effects on the Environment to Differ		Is there a Need for Further Assessment?	
Question:	Y / N (Briefly Describe)	Y / N (Briefly Describe)	
<p>Are there any:</p> <ul style="list-style-type: none"> • Areas on or around the site which are already subject to pollution / environmental damage (e.g. where environmental standards are exceeded); and / or, • Land uses on or around the site (e.g. homes / gardens / private property / industry / commerce / recreation / public open space / community facilities / agriculture / forestry / tourism / mining or quarrying); and / or, • Areas on or around the site which are occupied by sensitive land uses (e.g. hospitals / schools / places of worship / community facilities); and / or, • Areas on or around the site which are densely populated / built-up; <p>which could be affected by the Proposed Development in a way which differs from that previously described?</p>	<p>N</p> <p>The current baseline scenario with regards to ground conditions (geology and land contamination) is materially the same as that assumed previously, and likely significant effects on ground conditions (geology and land contamination) will not materially differ from those previously described.</p>	N	N / A
<p>Is the site susceptible to earthquakes / subsidence / landslides / or extreme / adverse climatic conditions (e.g. temperature inversions / fogs / severe winds) which could cause the Proposed Development to present environmental problems which differ from those previously described?</p>	<p>N</p> <p>The current baseline scenario with regards to ground conditions (geology and land contamination) is materially the same as that assumed previously, and likely significant effects on ground conditions (geology and land contamination) will not materially differ from those previously described.</p>	N	N / A

12.5 Need for an Updated Impact Assessment

Construction / Decommissioning

- 12.5.1 The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described.
- 12.5.2 Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on ground conditions (geology and land contamination) will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remains valid and appropriate.

Operation

- 12.5.3 The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described.
- 12.5.4 Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on ground conditions (geology and land contamination) will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remains valid and appropriate.

12.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 12.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on ground conditions (geology and land contamination).

13. WATER RESOURCES AND FLOOD RISK

13.1 Introduction

13.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding water resources;
- The likely significant direct and indirect / secondary effects of the Proposed Development on water resources previously described; and,
- The main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on water resources will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

13.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on water resources.

13.1.3 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

13.1.4 With regards to flood risk, this Section should be read in conjunction with the 2019 Updated Flood Risk Assessment. Appendix A provides the 2019 Updated Flood Risk Assessment.

13.2 Current State of the Environment (Baseline Scenario)

Baseline Scenario Assumed Previously

13.2.1 The baseline scenario assumed previously with regards to water resources includes that:

- The Proposed Development will be located within the overall red-line boundary (see Figure 63114-PBP-0025 associated with the 2016 Varied Consent).
- The overall red-line boundary, and the GEC site, will be located on the north bank of the Thames Estuary on land within the DP World® London Gateway Logistics Park, to the north of the DP World® London Gateway Port.
- As part of the agreement between GECL and DP World®, in advance of any construction works, the GEC site will be cleared, remediated and levelled, and provided to GECL in a condition that would allow for construction of the Proposed Development.

Baseline Scenario Assumptions Previously Described

13.2.2 Within the February 2010 ES it was noted that:

- The GEC site would be cleared, remediated and levelled, and provided to GECL in a condition that would allow for the construction of the Proposed Development. Therefore, the baseline for the Proposed Development site comprises bare earth and hardstanding.

13.2.3 Within the December 2010 Supplementary Flood Risk Assessment it was noted that:

- With regard to flood risk, the GEC site-specific breach analysis (using the existing ground conditions) suggested that the finished floor levels of GEC should be set a minimum of 3.2 m AOD, plus a required freeboard of at least 300 mm (in accordance with the (then) requirements of PPS 25 'Development and Flood Risk').

13.2.4 Subsequently, the Conditions of the 2011 Deemed Planning Permission (associated with the Original Consent) provided that:

- (at Condition (41)) the Proposed Development will include for the provision of safe routes(s) into and out of the Proposed Development site, and the provision of any place of refuge for staff / visitors to be provided at a minimum of 3.7 m AOD.

13.2.5 This Condition was retained within the 2014 Deemed Planning Permission (associated with the 2014 Varied Consent) and the 2016 Deemed Planning Permission (associated with the 2016 Varied Consent). Within the 2019 Variation Application, the overall provisions of this Condition will be retained.

13.2.6 Within the August 2014 ES FID it was noted that:

- With regards to the on-going construction and build-out of the DP World® London Gateway sites, the clearance, levelling and remediation works had commenced and would continue in accordance with a programme and in a manner that supports the on-going development. In particular, approximately 80% of the locations across the DP World® London Gateway sites which were known to require remediation had been successfully remediated.
- In addition, significant ground preparation works had been undertaken across the DP World® London Gateway sites such that they largely comprised bare ground.

13.2.7 At the time of writing this 2019 ES FID, it is noted that construction and build-out of the DP World® London Gateway sites continues, with approximately 113099 m² of Logistics Park 'B'-Class floor space and three Port berths currently operational. A further 41575 m² of Logistics Park 'B'-Class floor space and remaining three Port berths remain authorised, and will be delivered subject to commercial demand. Additional clearance, levelling and remediation continues in a manner to support this on-going development.

13.2.8 As noted in the August 2014 ES FID, it is also understood from DP World® that, within the Logistics Park and Port, development of an individual plot would only commence once it had been successfully cleared and remediated.

Summary

13.2.9 Whilst there have been some changes to the state of the environment, such changes were considered within the baseline scenario assumed previously. These changes included the on-going construction and build-out of the DP World® London Gateway sites.

13.2.10 Accordingly, the current baseline scenario regarding water resources (i.e. operational DP World® London Gateway sites) is materially the same as that assumed previously.

13.3 Likely Significant Effects Previously Described

Construction / Decommissioning

13.3.1 The likely direct effects previously described include those due to:

- Discharges of pollutants to water; and,
- Unplanned releases / spills.

Operation

13.3.2 The likely direct effects previously described include:

- Presence of the Proposed Development, and flood risk;
- Discharges of pollutants to water; and,
- Unplanned emissions / releases / spills.

13.4 Main Respects in which the Likely Significant Effects will Differ

13.4.1 Table 13.1 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on water resources will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 13.1: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT EFFECTS ON WATER RESOURCES AND FLOOD RISK WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>			<i>Is there a Need for Further Assessment?</i>	
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>		<i>Y / N (Briefly Describe)</i>	
Will the Proposed Development lead to risks of contamination of water from releases of pollutants into surface waters / ground waters / coastal waters / seas which differ from those previously described?	N	The Proposed Development will not lead to risks of contamination of water which materially differ from that previously described.	N	N / A
Will construction / operation / decommissioning of the Proposed Development involve actions which will cause physical changes in the locality (i.e. water bodies) which differ from those previously described?	N	Whilst the construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the construction of the Proposed Development will not involve actions which will cause physical changes in the locality (i.e. water bodies) which will materially differ from those previously described. Similarly, the operation / decommissioning of the Proposed Development will not involve actions which will cause physical changes in the locality (i.e. water bodies) which will materially differ from those previously described.	N	N / A
Are there any: <ul style="list-style-type: none"> • Areas on or around the site which are already subject to pollution / environmental damage (e.g. where environmental standards are exceeded); and / or, • Inland / coastal / marine / underground waters on or around the site; which could be affected by the Proposed Development in a way which differs from that previously described?	N	The current baseline scenario with regards to water resources is materially the same as that assumed previously, and likely significant effects on water resources will not materially differ from those previously described.	N	N / A

Potential for the Likely Significant Effects on the Environment to Differ		Is there a Need for Further Assessment?	
Question:	Y / N (Briefly Describe)	Y / N (Briefly Describe)	
Is the site susceptible to flooding or extreme or adverse climatic conditions (e.g. temperature inversions / fogs / severe winds) which could cause the Proposed Development to present environmental problems which differ from those previously described?	<p>U*</p> <p>Whilst the current baseline scenario with regards to flood risk is considered to be materially the same as that assumed previously (i.e. on-going construction and build-out of the DP World® London Gateway sites), further information relating to flood risk was requested by the Environment Agency.</p> <p>On 1 May 2019, a teleconference was held between the Environment Agency and Ramboll to discuss the flood risk issues on site, available updated data and information (i.e. between the February 2010 FRA and the December 2010 Supplementary FRA) and any considerations for an updated FRA.</p> <p>A scope of works for an updated FRA was subsequently submitted to and agreed with the Environment Agency.</p>	Y	Further information is provided in the 2019 Updated Flood Risk Assessment. Appendix A provides the 2019 Updated Flood Risk Assessment.

* Unlikely

13.5 Summary of the Updated Impact Assessment

Construction / Decommissioning

Water Resources

- 13.5.1 The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described.
- 13.5.2 Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on water resources will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

Flood Risk

- 13.5.3 With regards to flood risk, the 2019 Updated Flood Risk Assessment did not identify a requirement to alter the proposed finished floor levels from the current minimum level of 3.7 m AOD. Nevertheless, to reflect that there may be differing requirements for Development Option (i) and Development Option (i), the 2019 Variation Application proposes to include a new condition (Condition (41A)) to require that the commencement of each phase of the Proposed Development not take place until details of the flood resilience measures associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council. The flood resilience measures should ensure that the specified phase of the Proposed Development is able to remain operational in times of a residual flood event.

Operation

Water Resources

- 13.5.4 The current baseline scenario is materially the same as that assumed previously, and the likely effects of the Proposed Development are materially the same as those previously described.
- 13.5.5 Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on water resources will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

Flood Risk

- 13.5.6 With regards to flood risk, the 2019 Updated Flood Risk Assessment did not identify a requirement to alter the proposed finished floor levels from the current minimum level of 3.7 m AOD. Nevertheless, to reflect that there may be differing requirements for Development Option (i) and Development Option (i), the 2019 Variation Application proposes to include a new condition (Condition (41A)) to require that the commencement of each phase of the Proposed Development not take place until details of the flood evacuation measures associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council. The flood evacuation measures should ensure that operational personnel / visitors can be safely evacuated in times of a residual flood event.

13.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 13.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on water resources and flood risk.

14. TRAFFIC AND TRANSPORT INFRASTRUCTURE

14.1 Introduction

14.1.1 This Section has been prepared by TH Planning and Transportation.

14.1.2 This Section considers:

- The current state of the environment (baseline scenario) regarding traffic and transport infrastructure;
- The likely significant direct and indirect / secondary traffic and transport infrastructure effects of the Proposed Development previously described; and,
- The main respects in which the likely significant direct and indirect / secondary traffic and transport infrastructure effects of the Proposed Development will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

14.1.3 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant traffic and transport infrastructure effects.

14.1.4 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

14.1.5 This Section should be read in conjunction with the 2019 Transport Report Addendum. Appendix B provides the 2019 Transport Report Addendum.

14.2 Current State of the Environment (Baseline Scenario)

Basis

14.2.1 The current state of the environment, regarding traffic and transportation, is based on:

- 2007 Traffic Flow Surveys;
- Department for Transport Annual Average Daily Traffic (AADT) 24-hour two way vehicle flow estimates (2009);
- The TRADS2 website (traffic count survey information) (2009);
- National Road Traffic Forecast (NRTF) 1997 growth factors; and,
- Trip End Model Presentation Programme (TEMPRO) growth factors.

14.2.2 With regards to the use of 2007 traffic flow surveys and the application of growth factors, it should be noted that the TEMPRO growth factors are generally considered to overstate growth, as they are based on steady growth and do not take account of economic growth fluctuations.

Study Area

14.2.3 Table 14.1 and Table 14.2 summarise the highway links and junctions (respectively) defined within the study area within the February 2010 ES, the December 2010 ES FID and the August 2014 ES FID.

TABLE 14.1: HIGHWAY LINKS WITHIN STUDY AREA

Reference	Link	Carriageway Type
Link 1	A13 (M25 to A126)	Dual 2
Link 2	A13 (A126 to A1012)	Dual 3
Link 3	A13 (A1012 to A1089)	Dual 3
Link 4	A13 (A1089 to A128)	Dual 3

Link 5	A13 (A128 to A1014)	Dual 2
Link 6	A1014 (A13 to Southend Road)	Dual 2
Link 7	A1014 (Southend Rd to Sorrells)	Dual 2
Link 8	A1014 (Gate 2 to Gate 3)	Single

TABLE 14.2: HIGHWAY JUNCTIONS WITHIN STUDY AREA

Reference	Link	Carriageway Type
Junction 1	A13 / M25	Grade-separated signalised roundabout
Junction 2	A13 / A1012	Grade-separated roundabout
Junction 3	A13 / A1089	Slip link roads
Junction 4	A13 / A1014	Grade-separated roundabout
Junction 5	A1014 / Gate 3	Priority junction, with ghost right-turn lane

14.2.4 In late 2013, the construction for operational use of the DP World® London Gateway site access road facilitated an amended access route to the GEC site via the DP World® London Gateway Logistics Park internal estate roads. As a result, Link 8 and Junction 5 will no longer be affected by traffic associated with the Proposed Development. The February 2016 ES FID previously described such changes in circumstances, and the resulting differences in traffic and transportation effects.

14.2.5 The February 2010 ES, the December 2010 ES FID and the August 2014 ES FID considered an assessment year of 2014. Within the February 2016 ES FID, this was updated to an assessment year of 2019. Within this 2019 ES FID, an assessment year of 2023 is being considered.

14.3 Likely Significant Effects Previously Described

Construction / Decommissioning

14.3.1 The likely direct effects previously described include those due to:

- Short-term additional vehicular traffic on the public highway network (links and junctions within the study area).

Operation

14.3.2 The likely direct effects previously described include those due to:

- Long-term additional vehicular traffic on the public highway network (links and junctions within the study area).

14.4 Main Respects in which the Likely Significant Effects will Differ

14.4.1 Table 14.3 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary traffic and transport infrastructure effects of the Proposed Development will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 14.3: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT TRAFFIC AND TRANSPORT INFRASTRUCTURE EFFECTS WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>		
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>		
Will the level or characteristics of traffic generated by the Proposed Development materially differ from that previously described?	N	Whilst construction of the Proposed Development may include a number of phases, there are no material changes to the main construction characteristics, and the level and characteristics of the traffic generated by the Proposed Development will not materially differ from that previously described. Similarly, during decommissioning, the level and characteristics of the traffic generated by the Proposed Development will not materially differ from that previously described.	N	N / A
	N	Whilst operation of the Proposed Development may be over a number of phases, there are no material changes to the main operational characteristics, and the level and characteristics of the traffic generated by the Proposed Development will not materially differ from that previously described	N	N / A

Potential for the Likely Significant Effects on the Environment to Differ		Is there a Need for Further Assessment?	
Question:	Y / N (Briefly Describe)	Y / N (Briefly Describe)	
Does the level or characteristics of the baseline flows on the links and junctions within the study area materially differ from that previously described?	Y The February 2010 ES, the December 2010 ES FID and the August 2014 ES FID considered an assessment year of 2014. Within the February 2016 ES FID, this was updated to an assessment year of 2019. Within this 2019 ES FID, a revised assessment year of 2023 is being considered. The predicted growth in baseline flows between the assessment year of 2014 (considered within the February 2010 ES, the December 2010 ES FID and the August 2014 ES FID) and the assessment year of 2023 (this 2019 ES FID) equate to approximately 22%. Section 5.3 (Baseline Flows on the Transport Network) of the 2019 Transport Report Addendum describes the nature of this growth. Additionally, further third-party development proposals have become committed in the vicinity of the Proposed Development which will influence the level and characteristics of baseline flows.	Y	Due to the predicted growth in baseline flows, there is a need to update the impact assessment in order to describe the main respects in which the likely significant traffic and transportation effects of the Proposed Development will differ from those previously described.
Have there been any changes to the layout or character of any of the links and junctions within the study area which materially differ from that previously described?	Y Following the preparation of the February 2016 ES FID, a number of additional link and junction improvement schemes have been committed, commenced and / or completed within the study area. Section 5.5 (Implemented of Committed Transport Schemes or Services) of the 2019 Transport Report Addendum describes these schemes, and the associated changes to the layout and / or characteristics of these links and junctions.	Y	Due to the changes to the layout and / or characteristics of the links and junctions within the study area, there is a need to update the impact assessment in order to describe the main respects in which the likely significant traffic and transportation effects of the Proposed Development will differ from those previously described.
Have there been any changes to the sustainable transport facilities and services serving to provide access to the Proposed Development site which materially differ from that previously described?	Y Following the preparation of the February 2016 ES FID, in June 2018, a new (private) bus service was implemented providing direct connectivity between Stanford-le-Hope train station and the GEC site. This bus service is available for use by operatives employed in the construction and / or operation of the Proposed Development.	Y	Due to the changes to the sustainable transport facilities and services, there is a need to update the impact assessment in order to describe the main respects in which the likely significant traffic and transportation effects of the Proposed Development will differ from those previously described.

14.5 Summary of the Updated Impact Assessment

- 14.5.1 For construction / operation / decommissioning, the level and characteristics of the traffic generated by the Proposed Development will not materially differ from that previously described.
- 14.5.2 However, with regard to the current state of the environment (baseline scenario) there has been:
- (a) Predicted growth in baseline flows (due to a the revision of the assessment year from 2014 /2019 to 2023);
 - (b) Growth in baseline flows (with associated influence on the level and characteristics of the baseline flows) as due to further third-party development proposals which have become committed in the vicinity of the Proposed Development;
 - (c) Changes to the layout and / or characteristics of the links and junctions within the study area (due to a number of scheme having been committed, commenced and / or completed); and,
 - (d) Changes to the sustainable transport facilities and services serving to provide access to the Proposed Development site.
- 14.5.3 Therefore, there is a need to update the impact assessment in order to describe the main respects in which the likely significant traffic and transportation effects of the Proposed Development will differ from those previously described.
- 14.5.4 Accordingly, Section 6 (Highway Capacity Impact Assessment) and Section 7 (Highway Safety Impact Assessment) of the 2019 Transport Report Addendum provides qualitative assessment due to the changes to the current state of the environment.

Construction

- 14.5.5 For construction, Table 14.4 and Table 14.5 summarise this qualitative assessment for the highway links and junctions (respectively) within the study area.

TABLE 14.4: SUMMARY OF QUALITATIVE ASSESSMENT FOR THE HIGHWAY LINKS WITHIN THE STUDY AREA

<i>Road</i>	<i>Link</i>	<i>February 2010 ES Likely Effect</i>	<i>Effect of Change in Circumstance</i>		<i>2019 Likely Effect</i>
			<i>2016</i>	<i>2019</i>	
A13	M25 to A126	Negligible	Beneficial	Minor Adverse	Negligible
	A126 to A1012	Negligible	Moderately Adverse	Minor Adverse	Minor Adverse
	A1012 to A1089	Negligible	Moderately Adverse	Minor Adverse	Minor Adverse
	A1089 to A128	Negligible	Moderately Adverse	Minor Adverse	Minor Adverse
	A128 to A1014	Negligible	Beneficial	Minor Beneficial	Negligible
A1014	A13 to Sorrells Roundabout	Negligible	Neutral	Minor Adverse	Negligible

TABLE 14.5: SUMMARY OF QUALITATIVE ASSESSMENT FOR THE HIGHWAY JUNCTIONS WITHIN THE STUDY AREA

<i>Junction</i>	<i>February 2010 ES Likely Effect</i>	<i>Effect of Change in Circumstance</i>		<i>2019 Likely Effect</i>
		<i>2016</i>	<i>2019</i>	
M25 / A13 Junction 30	Negligible	Beneficial	Minor Adverse	Negligible
A13 / A1012	Negligible	Neutral	Negligible	Negligible
A13 / A1089	Negligible	Neutral	Negligible	Negligible
A13 / A1014	Negligible	Beneficial	Minor Adverse	Negligible

- 14.5.6 Based on Table 14.4 and Table 14.5, it is demonstrated that the 2019 effects of the changes in circumstance range from minor beneficial to minor adverse (albeit not directly attributable to the Proposed Development). Overall, a number of likely direct and indirect / secondary effects have changed from negligible (from the February 2010 ES) to minor adverse (this 2019 ES FID), and are anticipated to remain Not Significant.

Operation

- 14.5.7 For operation, the levels and characteristics of the traffic generated will be significantly lower than for construction. Therefore, the likely direct and indirect / secondary effects are anticipated to be negligible, and remain Not Significant.

14.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 14.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant traffic and transportation effects.

15. HISTORIC ENVIRONMENT

15.1 Introduction

15.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding the historic environment;
- The likely significant direct and indirect / secondary effects of the Proposed Development on the historic environment previously described; and,
- The main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on the historic environment will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

15.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on the historic environment.

15.1.3 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

15.2 Current State of the Environment (Baseline Scenario)

Buried Archaeological Features

15.2.1 Within the December 2010 ES FID it was noted that:

- The potential for any buried features at the Proposed Development site is considered to be minimal due to the related previous heavy industrial development of the site which has been informed by numerous site walkover surveys, geophysical assessments, intrusive investigations and sub-surface reconstructions. The previous heavy industrial development included the Shell Haven Oil Refinery.
- However, it was noted that Essex County Council recommended further investigation of the Proposed Development site prior to commencement, with any such investigation informed by the 'Archaeological Deposit Model' which was being undertaken for the DP World® London Gateway sites.

15.2.2 Subsequently, the Conditions of the 2011 Deemed Planning Permission (associated with the Original Consent) provided that:

- (at Condition (42)) the commencement of the Proposed Development not take place until a scheme of archaeological investigation and associated implementation programme has been submitted to and approved in writing by Thurrock Borough Council.

15.2.3 This Condition was retained within the 2014 Deemed Planning Permission (associated with the 2014 Varied Consent) and the 2016 Deemed Planning Permission (associated with the 2016 Varied Consent). Whilst the 2019 Variation Application seeks vary these Conditions to required that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council, the overall provisions of this Condition will be retained.

15.2.4 Furthermore, within the DP World® London Gateway Logistics Park 'Code of Construction Practice'⁴⁶ (2013) it is noted that:

- There are no protected archaeological sites of historic landscapes present within the Proposed Development site, or within the wider DP World® London Gateway sites. However, the site has potential for archaeological remains.

⁴⁶ London Gateway Logistics Park: Local Development Order 'Code of Construction Practice', October 2013. Available at: https://www.thurrock.gov.uk/sites/default/files/assets/documents/ldo_report_making_20131023_app1_4.pdf

- Nevertheless, in the majority of cases it is expected that construction works will not have significant impact on any such archaeological remains due to the site raising works. Indeed, on Figure 8 'Areas of High Archaeological Potential', the Proposed Development site is shown to be located within an area classified as: "*Floodplain: very low archaeological potential - mitigation unlikely unless deep excavation is required*".
- Accordingly, for development within the wider DP World® Logistics Park site, prior to commencement, archaeological assessments and associated investigation proposals should be submitted to and approved by Thurrock Borough Council.

Above Ground Cultural Heritage Features

- 15.2.5 Within the February 2010 ES, the Scheduled Ancient Monuments (SAM) within a 5 km radius of the Proposed Development site and the Listed Buildings within a 2.5 km radius of the Proposed Development site were previously described.
- 15.2.6 Table 15.1 provides a summary of the SAM within a 5 km radius of the Proposed Development site. Table 15.2 provides a summary of the Listed Buildings within a 2.5 km radius of the Proposed Development site.
- 15.2.7 Further to Table 15.1 and Table 15.2, there have been no additional SAM or Listed Buildings which have been designated⁴⁷.

Summary

- 15.2.8 The current state of the environment regarding the historic environment is materially the same as that previously described.

⁴⁷ Based on information available at:
<https://magic.defra.gov.uk/home.htm>

TABLE 15.1: SUMMARY OF SCHEDULED ANCIENT MONUMENTS WITHIN 5 KM OF THE PROPOSED DEVELOPMENT SITE

<i>National Monument #</i>	<i>Description</i>	<i>Date Designated</i>	<i>Distance from GEC Site (km)</i>
32445 (1020489)	World War II Bombing Decoy on Fobbing Marshes, 1.11 km and 1.15 km North West of Oozedam	05/07/2002	1.9 North
32433 (1019107)	Heavy Anti-Aircraft Gunsite, 380 m East of Northwick farm	07/07/2000	3.4 North East
32424 (1019038)	Roman Saltern, 260 m South East of Great Russell Head Farm, Canvey Island	15/03/1972	5.2 North East

TABLE 15.2: SUMMARY OF LISTED BUILDINGS WITHIN 2.5 KM OF THE PROPOSED DEVELOPMENT SITE

<i>Reference</i>	<i>Description</i>	<i>Grade</i>	<i>Date Designated</i>	<i>Distance from GEC Site (km)</i>
1147121	Great Garlands Farmhouse with Stable on North West	II	1.8	04/03/1976
1337119	1 and 3, Ship Cottages	II	2.0	10/11/1981
1147899	Fobbing Hall	II	2.1	10/11/1981
1111542	Hillcrest Cottages	II	2.2	04/03/1976
1111597	1 and 2, Church View Cottages	II	2.2	10/11/1981
1146807	Church of St Michael	I	2.2	08/02/1960
1111636	Pell House	II	2.3	08/02/1960
1111596	Prosbush Hall	II	2.3	08/02/1960
1308790	1 and 2, Curtis Cottages	II	2.3	10/11/1981
1337092	Weatherboarded Granary at Curtis's Farm	II	2.3	10/11/1981
1111579	1 and 2, Lion Hill	II	2.3	10/11/1981
1111578	White Lion Public House	II	2.4	10/11/1972
1111595	1 and 2, Paynes Cottages	II	2.4	10/11/1981
1111622	Corringham Hall	II	2.4	10/11/1981
1146734	Walnut Tree Cottages	II	2.4	17/10/1977
1111621	Hall Farm Cottages	II	2.5	19/11/1976
1337083	Church of St Mary	I	2.5	08/02/1960
1146837	Wheelers House	II	2.5	08/02/1960

15.3 Likely Significant Effects Previously Described

Construction / Decommissioning

15.3.1 The likely effects previously described include those due to:

- Direct effects, comprising the potential for construction / decommissioning activities (e.g. earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations) to damage and / or disturb unknown buried archaeological features; and,
- Indirect / secondary effects, comprising the potential for the construction / decommissioning activities (e.g. presence of construction plant / equipment / vehicles and use of lighting to ensure that the construction personnel can move around the Proposed Development site safely during the hours of darkness) to disrupt the setting of and / or appreciation of above ground cultural heritage features (such as Scheduled Ancient Monuments and Listed Buildings).

Operation

15.3.2 The likely effects previously described include those due to:

- Indirect / secondary effects, comprising the potential for the presence of the Proposed Development to disrupt the setting of and / or appreciation of cultural heritage features (such as Scheduled Ancient Monuments and Listed Buildings).

15.4 Main Respects in which the Likely Significant Effects will Differ

15.4.1 Table 15.3 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary effects of the Proposed Development on the historic environment will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 15.3: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT EFFECTS ON HISTORIC ENVIRONMENT (ARCHAEOLOGY / CULTURAL HERITAGE) WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>	
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>	
Are there any: <ul style="list-style-type: none"> • Areas on or around the site which are protected under international / national / local legislation for their cultural heritage value; and / or, • Areas or features of historic / cultural importance on or around the site; which could be affected by the Proposed Development in a way which differs from that previously described?	N The current state of the environment regarding the historic environment is materially the same as that previously described, and the likely effects of the Proposed Development on the historic environment are materially the same as those previously described.	N	N / A

15.5 Need for an Updated Impact Assessment

Construction / Decommissioning

- 15.5.1 The current state of the environment (baseline scenario) is materially the same as that previously described, and the likely effects of the Proposed Development are materially the same as those previously described.
- 15.5.2 Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary effects of the Proposed Development on the historic environment will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

Operation

- 15.5.3 The current state of the environment (baseline scenario) is materially the same as that previously described, and the likely effects of the Proposed Development are materially the same as those previously described.
- 15.5.4 Therefore, during operation, the likely significant direct and indirect / secondary effects of the Proposed Development on the historic environment will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

15.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 15.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects on the historic environment.

16. SOCIO-ECONOMICS

16.1 Introduction

16.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding socio-economics;
- The likely significant direct and indirect / secondary socio-economic effects of the Proposed Development previously described; and,
- The main respects in which the likely significant direct and indirect / secondary socio-economic effects of the Proposed Development will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

16.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant socio-economic effects.

16.1.3 Section 17 (Cumulative Impacts) considers the likely significant cumulative effects, and the main respects in which the likely significant cumulative effects will differ from those previously described.

16.2 Current State of the Environment (Baseline Scenario)

Basis

16.2.1 Similar to the February 2010 ES, the August 2014 ES FID and the February 2016 ES FID, the current state of the environment regarding socio-economics is based on available data from the Office of National Statistics (available at: <https://www.nomisweb.co.uk/>⁴⁸).

Demographic Baseline / Population

16.2.2 It was previously described that the population of Thurrock increased at a greater growth rate than the population of both the 'East' and 'Great Britain'.

16.2.3 Table 16.1 presents a summary of the demographic baseline / population data, which demonstrates that the population of Thurrock continues to increase at a greater growth rate than the population of both the 'East' and 'Great Britain', and that the growth rate is materially the same as that previously described (for Thurrock, approximately 1.5% per year, and for both the 'East' and 'Great Britain', approximately 1% per year).

Qualifications / Skills and Education

16.2.4 It was previously described that the percentage of people in Thurrock that are qualified to at least National Vocational Qualification (NVQ) Level 3 was slightly lower than the percentage of people in both the 'East' and 'Great Britain'. In addition, it was previously described that the percentage of people in Thurrock holding no qualifications was slightly higher than the percentage of people in both the 'East' and 'Great Britain'.

16.2.5 Table 16.2 presents a summary of the qualifications / skills and education data, which demonstrates that the percentage of people in Thurrock that are qualified to at least NVQ Level 3 remains slightly lower than the percentage of people in both the 'East' and 'Great Britain'. Overall, the pattern is materially the same as that previously described.

16.2.6 In addition, Table 16.2 demonstrates that percentage of people in Thurrock holding no qualifications remains slightly higher than the percentage of people in both the 'East' and 'Great Britain'. Overall, the pattern is materially the same as that previously described.

Labour Force and Employment / Economic Baseline /

16.2.7 It was previously described that the percentage of the working age population who are economically active in Thurrock was slightly lower than the percentage of people in the 'East', but higher than the percentage of people in 'Great Britain'. In addition, it was previously described that the percentage of the economically active population who are in

⁴⁸ Website accessed on 06/06/2019.

employment in Thurrock was slightly lower than the percentage of people in the 'East', but higher than the percentage of people in 'Great Britain'.

- 16.2.8 Table 16.3 presents a summary of the labour force and employment / economic baseline data, which demonstrates that these percentages remain slightly lower than the percentages for the 'East', but higher than the percentages for 'Great Britain'. Overall, the pattern is materially the same as that previously described.
- 16.2.9 Furthermore, it was previously described that the mean gross weekly income in Thurrock compared with both the 'East' and 'Great Britain' had been subject to some minor fluctuations.
- 16.2.10 Table 16.3 demonstrates that these minor fluctuations remain, but overall the mean gross weekly income in Thurrock compared with both the 'East' and 'Great Britain' has risen at approximately the same average rate (between 2 to 3% per year).

Occupational Profile

- 16.2.11 It was previously described that, in Thurrock, the largest percentage of people were employed in the 'Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles' sector, followed by the 'Public Administration, Education and Health' sector, and the 'Financial and Other Businesses Sector' sector.
- 16.2.12 Table 16.4 presents a summary of the occupational profile data, which demonstrates that this pattern is materially the same as that previously described.
- 16.2.13 Furthermore, it was previously described that, in Thurrock, there had been decreases in the percentages of people employed in the 'Construction' sector and 'Manufacturing' sector.
- 16.2.14 Table 16.4 demonstrates that there have been some slight increases in the percentages of people employed in these sectors, but overall the percentages remain lower than originally described.

TABLE 16.1: DEMOGRAPHIC BASELINE / POPULATION DATA

	<i>Thurrock</i>		<i>'East'</i>		<i>'Great Britain'</i>	
	<i>Data</i>	<i>Increase from February 2010 ES</i>	<i>Data</i>	<i>Increase from February 2010 ES</i>	<i>Data</i>	<i>Increase from February 2010 ES</i>
February 2010 ES	151,600	-	5,728,700	-	59,608,200	-
August 2014 ES FID	160,800	6.1%	5,954,200	3.9%	62,275,900	4.5%
February 2016 ES FID	163,300	7.7%	6,018,400	5.1%	62,765,300	5.3%
2019	170,400	12.4%	6,168,400	7.7%	64,169,400	7.7%

TABLE 16.2: QUALIFICATIONS / SKILLS AND EDUCATION DATA

	<i>Thurrock</i>		<i>'East'</i>		<i>'Great Britain'</i>	
	<i>Data</i>	<i>Increase from February 2010 ES</i>	<i>Data</i>	<i>Increase from February 2010 ES</i>	<i>Data</i>	<i>Increase from February 2010 ES</i>
<i>NVQ Level 3 Qualification</i>						
February 2010 ES	32.8%	-	43.4%	-	47.0%	-
August 2014 ES FID	43.6%	10.8	53.6%	10.2	55.8%	8.8
February 2016 ES FID	44.2%	11.4	-	-	-	-
2019	41.5%	8.7	53.1%	9.7	57.8%	10.8
<i>No Qualifications</i>						
February 2010 ES	19.8%	-	11.8%	-	12.4%	-
August 2014 ES FID	11.4%	-8.4	8.4%	-3.4	9.3%	-3.1
February 2016 ES FID	12.2%	-7.6	-	-	-	-
2019	12.2%	-7.6	7.4%	-4.4	7.8%	-4.6

TABLE 16.3: LABOUR FORCE AND EMPLOYMENT / ECONOMIC BASELINE DATA

	Thurrock		'East'		'Great Britain'	
	Data	Increase from February 2010 ES	Data	Increase from February 2010 ES	Data	Increase from February 2010 ES
Working Age Population						
February 2010 ES	95,000	-	-	-	-	-
August 2014 ES FID	103,800	9.3%	-	-	-	-
February 2016 ES FID	104,900	10.4%	-	-	-	-
2019	108,000	13.7%	-	-	-	-
% of Working Age Population who are Economically Active						
February 2010 ES	80.4%	-	81.7%	-	78.9%	-
August 2014 ES FID	79.5%	-0.9	80.3%	-1.4	77.4%	-1.5
February 2016 ES FID	77.5%	-2.9	-	-	-	-
2019	79.1%	-1.3	80.8%	-0.9	78.5%	-0.4
% of Economically Active Population who are in Employment						
February 2010 ES	75.2%	-	77.3%	-	73.9%	-
August 2014 ES FID	73.8%	-1.4	75.5%	-1.8	71.7%	-2.2
February 2016 ES FID	72.6%	-2.6	-	-	-	-
2019	75.9%	0.7	78.0%	0.7	75.1%	1.2
Mean Gross Weekly Income						
February 2010 ES	£473.30	-	£468.10	-	£479.10	-
August 2014 ES FID	-	-	-	-	-	-
February 2016 ES FID	£487.10	2.9%	£517.50	10.6%	£529.00	10.4%
2019	£579.30	22.4%	£590.30	26.1%	£571.10	19.2%

TABLE 16.4: OCCUPATIONAL PROFILE DATA

	<i>Thurrock</i>	
	<i>Data</i>	<i>Increase from February 2010 ES</i>
<i>'Wholesale and Retail Trade; Repair or Motor Vehicles and Motorcycles'</i>		
February 2010 ES	22.1%	-
August 2014 ES FID	24.2%	2.1
February 2016 ES FID	29.2%	7.1
2019	26.6%	4.5
<i>'Public Administration, Education and Health'¹</i>		
February 2010 ES	20.9%	-
August 2014 ES FID	22.6%	1.7
February 2016 ES FID	20.0%	-0.9
2019	21.1%	0.2
<i>'Financial and Other Businesses Sector'²</i>		
February 2010 ES	15.6%	-
August 2014 ES FID	17.6%	2.0
February 2016 ES FID	14.6%	-1.0
2019	13.4%	-2.2
<i>'Construction'</i>		
February 2010 ES	10.5%	-
August 2014 ES FID	9.7%	-0.8
February 2016 ES FID	5.2%	-5.3
2019	6.2%	-4.3
<i>'Manufacturing'</i>		
February 2010 ES	13.9%	-
August 2014 ES FID	7.3%	-6.6
February 2016 ES FID	5.0%	-8.9
2019	5.5%	-8.4

¹ Combination of: 'O: Public Administration and Defence; Compulsory Social Security'; 'P: Education'; and, 'Q: Human Health and Social Work Activities'.

² Combination of: 'K: Financial and Insurance Activities'; 'L: Real Estate Activities'; 'M: Professional, Scientific and Technical Activities'; and, 'N: Administrative and Support Service Activities'.

Summary

16.2.16 The state of the environment regarding socio-economics is materially the same as that previously described.

16.3 Likely Significant Effects Previously Described

Construction / Decommissioning

16.3.1 The likely effects previously described include those due to:

- Direct positive effects due to short-term employment opportunities; and,
- Indirect / secondary positive effects due to increases in the use of local services and businesses.

Operation

16.3.2 The likely effects previously described include those due to:

- Direct positive effects due to long-term employment opportunities; and,
- Indirect / secondary positive effects due to increases in the use of local services and businesses.

16.4 Main Respects in which the Likely Significant Effects will Differ

16.4.1 Table 16.4 presents the specific questions designed to determine the main respects in which the likely significant direct and indirect / secondary socio-economic effects of the Proposed Development will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 16.4: MAIN RESPECTS IN WHICH THE LIKELY SIGNIFICANT EFFECTS ON SOCIO-ECONOMICS WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>	
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>	
Will the Proposed Development result in social or economic changes (i.e. in demography / traditional lifestyles / employment) which differ from those previously described?	N Whilst construction of the Proposed Development may include a number of phases, there will be no material changes to the types of construction skills required. However, for construction of the Proposed Development over a number of phases, the short-term employment opportunities and associated increase in the use of local services per phase would be reduced, but would be experienced over a longer overall period. Nevertheless, during construction, the Proposed Development will not result in social or economic changes which materially differ from those previously described. Similarly, during decommissioning, the Proposed Development will not result in social or economic changes which materially differ from those previously described.	N	N / A
	N Whilst operation of the Proposed Development may be over a number of phases, there will be no material changes to the types of operational skills required. Therefore, during operation, the Proposed Development will not result in social or economic changes which materially differ from those previously described.	N	N / A

16.5 Need for an Updated Impact Assessment

Construction / Decommissioning

- 16.5.1 The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not result in social or economic changes which materially differ from those previously described.
- 16.5.2 Therefore, during construction / decommissioning, the likely significant direct and indirect / secondary socio-economic effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

Operation

- 16.5.3 The current state of the environment (baseline scenario) is materially the same as that previously described, and the Proposed Development will not result in social or economic changes which materially differ from those previously described.
- 16.5.4 Therefore, during operation, the likely significant direct and indirect / secondary socio-economic effects of the Proposed Development will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate.

16.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 16.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant socio-economic effects.

17. CUMULATIVE IMPACTS

17.1 Introduction

17.1.1 This Section considers:

- The current state of the environment (baseline scenario) regarding ancillary developments associated with the Proposed Development, and other planned projects / developments;
- The likely significant cumulative effects of the Proposed Development with the ancillary developments and other planned projects / developments;
- The main respects in which the likely significant cumulative effects of the Proposed Development will differ from those previously described in the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID.

17.1.2 Subsequently, Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects.

17.2 Current State of the Environment (Baseline Scenario)

Ancillary Developments associated with the Proposed Development

17.2.1 Table 17.1 presents the ancillary developments associated with the Proposed Development previously described.

TABLE 17.1: ANCILLARY DEVELOPMENTS PREVIOUSLY DESCRIBED

<i>Ancillary Development</i>	<i>Description</i>
Gas Connection	<p>During operation, both the CCGT unit(s) and the OCGT unit(s) will burn natural gas only, which will be required to be supplied to the GEC site via an underground gas pipeline.</p> <p>On 8 March 2012, planning permission (Reference: 11/50286/TTGFUL) was granted to GECL by Thurrock Thames Gateway Development Corporation (TTGDC). The application for planning permission was supported by the required environmental impact assessment.</p> <p>Following discharge of the relevant conditions, this planning permission was implemented on 7 March 2017 by the construction of a new access road to the associated AGI.</p>
HV Electrical Connection	<p>For both Development Options, during operation, the electricity generated will be dispatched to the National Grid Electricity National Transmission System via a new HV electrical connection from the GEC site into the existing National Grid Coryton South Substation.</p> <p>On 27 February 2013, planning permission (12/01085/FUL) was granted to GECL by Thurrock Borough Council. The application for planning permission was supported by the required environmental impact assessment.</p> <p>However, this development was not commenced, and the planning permission has since expired.</p>

17.2.2 Further to the above, Table 17.2 presents the additional ancillary developments associated with the Proposed Development. With regards to these additional ancillary developments, it should be noted that the preferred route options are still to be confirmed, and are currently subject to initial feasibility work. Therefore, it is not possible to detail the potential effects on the environment in a specific manner. However, it is not anticipated that these would be materially different from those of the ancillary developments previously described. Furthermore, the applications for the relevant authorisations for the additional ancillary developments will be supported by the required environmental impact assessment.

TABLE 17.2: ADDITIONAL ANCILLARY DEVELOPMENTS

<i>Ancillary Development</i>	<i>Description</i>
New Gas Connection	Under Development Option (ii), should there be phasing of GEC with the OCGT unit(s) constructed and operated in advance of the CCGT unit, there is sufficient capacity within the existing underground gas pipeline serving the existing Coryton CCGT generating station for the OCGT unit(s). Therefore, GECL are currently investigating the potential for a shorter length of underground gas pipeline based on a 'tap-in' to the existing underground gas pipeline serving the existing Coryton CCGT generating station. As part of this 'tap-in', a smaller AGI would also be required. In progressing this investigation, GECL has commissioned some initial gas feasibility work to identify possible new route options and AGI locations.
New HV Electrical Connection	As the HV Electrical Connection previously described was not commenced, and the planning permission has since expired, GECL has commissioned some initial electrical feasibility work to identify possible new route options for the HV electrical connection.

Other Planned Projects / Developments

17.2.3 Table 17.3 presents the other planned projects / developments previously described.

TABLE 17.3: OTHER PLANNED PROJECTS / DEVELOPMENTS PREVIOUSLY DESCRIBED

<i>Project / Development</i>	<i>Description</i>
DP World® London Gateway Logistics Park	The DP World® London Gateway projects / developments include the re-development of the former Shell Oil Refinery site at Shell Haven, together with associated transport connections, reclamation of part of the foreshore of the River Thames, and dredging of higher part of the navigation channel within the River Thames Estuary. At the time of writing this 2019 ES FID, it is noted that construction and build-out of the DP World® London Gateway sites continues, with approximately 113099 m ² of Logistics Park 'B'-Class floor space and three Port berths currently operational. A further 41575 m ² of Logistics Park 'B'-Class floor space and remaining three Port berths remain authorised, and will be delivered subject to commercial demand.
DP World® London Gateway Port	

17.2.4 Further to the above, Table 17.4 presents the additional other planned projects / developments.

TABLE 17.4: ADDITIONAL OTHER PLANNED PROJECTS / DEVELOPMENTS

<i>Project / Development</i>	<i>Description</i>
Lower Thames Crossing ⁴⁹	The Lower Thames Crossing will be a new road crossing, connecting Essex and Kent. The Lower Thames Crossing is located approximately 7 km south west of the Proposed Development site. Highways England note that: " <i>this new crossing will offer improved journeys, new connections and network reliability, and economic benefits that only a new, alternative crossing, away from Dartford, can provide</i> ". An application for a Development Consent Order for the Lower Thames Crossing is expected to be submitted in Q3 2019. As such limited information is available on this project / development, and this project / development is not considered further.

⁴⁹ Information available at:
<https://infrastructure.planninginspectorate.gov.uk/projects/south-east/lower-thames-crossing/>

<i>Project / Development</i>	<i>Description</i>
Thames Enterprise Park	The Thames Enterprise Park comprises the redevelopment of the former Petroplus Coryton Oil Refinery site, located approximately 950 m east of the Proposed Development site. An application for planning permission was submitted to Thurrock Borough Council on 27 September 2018, and is currently awaiting a decision (June 2019).
Thurrock Flexible Generation Plant ⁵⁰	Thurrock Flexible Generation Plant comprises the construction and operation of up to 600 MW Gas Reciprocating Engines, and a 150 MW Battery Energy Storage System. The Thurrock Flexible Generation Plant is located approximately 7 km south west of the Proposed Development site. An application for a Development Consent Order for the Thurrock Flexible Generation Plant is expected to be submitted in Q3 2019. As such limited information is available on this project / development, and this project / development is not considered further.
Tilbury2 Port ⁵¹	Tilbury2 Port is a new port facility located alongside the existing Tilbury Port. Tilbury2 Port is located approximately 10 km south west of the Proposed Development site. The project / development will include the extension of the existing jetty facilities, the dredging of berth pockets in the River Thames and land works. The project / development will provide the following: <ul style="list-style-type: none"> • A 'Roll-On / Roll-Off' (Ro-Ro) terminal for importing and exporting containers on road trailers; • A facility for importing and processing bulk construction materials; and, • Areas of external storage for a variety of goods (e.g. imported cars). The project / development also includes the construction of road and rail links to the site from adjacent networks. A Development Consent Order for Tilbury2 Port was granted on 20 February 2019.
Tilbury Green Power	Tilbury Green Power is a biomass / energy from waste generating station. During phase 1 (Section 36 Consent granted in 2009), the generating station will burn biomass, and during phase 2 (which is the subject of the application under Section 36C of the Electricity Act 1989) the generating station will be an energy from waste facility. Tilbury Green Power is located approximately 10 km south west of the Proposed Development site. An application under Section 36C of the Electricity Act 1989 to increase the capacity of the development from 60 MW to 80 MW was submitted in February 2019.

17.3 Likely Significant Effects Previously Described

17.3.1 With regards to the likely significant effects previously described, for cumulative impacts the following were considered:

- **Type 1: Interaction of Effects**

These are the interaction of effects of different types on the same receptor. For example, noise and vibration effects with traffic and transport infrastructure effects.

- **Type 2: Combined Effects**

⁵⁰ Information available at:

<https://infrastructure.planninginspectorate.gov.uk/projects/south-east/thurrock-flexible-generation-plant/?ipcsection=overview>

⁵¹ Information available at:

<https://infrastructure.planninginspectorate.gov.uk/projects/south-east/tilbury2/>

These are the combined effects from ancillary developments and other planned projects / developments with the Proposed Development.

Type 1 Effects

17.3.2 Table 17.5 presents a summary of the likely Type 1 effects previously described. As with the December 2010 ES FID and the August 2014 ES FID, rather than undertaking an assessment of the potential for significant effects on each possible receptor, groups of sensitive receptors were selected based on criteria comprising: proximity to the Proposed Development site; and, likely duration of exposure. Within Table 17.5, the following effects are described:

- For Construction / Decommissioning:
 - AQ: Temporary, local, adverse effects on air quality.
 - N&V: Temporary, local, adverse noise and vibration effects.
 - L&V: Temporary, local adverse visual effects.
 - L: Temporary loss of land due to construction works.
 - GC: Temporary, local, adverse effects on ground conditions.
 - WR: Temporary, local, adverse effects on water resources.
 - T&TI: Temporary, local, adverse traffic and transport infrastructure effects.
- For Operation:
 - V: Permanent visual effects.
 - L: Permanent loss of land.
 - T&TI: Permanent traffic and transport infrastructure effects.

Type 2 Effects

17.3.3 Table 17.6 presents a summary of the likely Type 2 effects previously described.

TABLE 17.5: LIKELY TYPE 1 EFFECTS PREVIOUSLY DESCRIBED

<i>Sensitive Receptor</i>	<i>Construction / Decommissioning⁵²</i>	<i>Operation</i>
Nearby Residential Receptors	During construction / decommissioning, the likely interaction of effects comprise: <ul style="list-style-type: none"> • AQ; • N&V; • L&V; and, • T&TI. 	During operation, the likely interaction of effects comprise: <ul style="list-style-type: none"> • V; and, • T&TI.
Adjacent Commercial Properties / Users	During construction / decommissioning, the likely interaction of effects comprise: <ul style="list-style-type: none"> • AQ; • N&V; and, • T&TI. 	No interaction of effects was previously described.
Land Owners	During construction / decommissioning, the likely interaction of effects comprise: <ul style="list-style-type: none"> • AQ; • N&V; • L; and, • T&TI. 	No interaction of effects was previously described.
Protected Species	During construction / decommissioning, the likely interaction of effects comprise: <ul style="list-style-type: none"> • AQ; • N&V; • GC; and, • WR. 	No interaction of effects was previously described.
Adjacent Agricultural Land / Surface Waters	During construction / decommissioning, the likely interaction of effects comprise: <ul style="list-style-type: none"> • AQ; • N&V; • GC; and, • WR. 	No interaction of effects was previously described.

⁵² Should the decommissioning of Proposed Development coincide with the decommissioning of the ancillary developments and other planned projects / developments.

TABLE 17.6: LIKELY TYPE 2 EFFECTS PREVIOUSLY DESCRIBED

Aspect	Construction / Decommissioning⁵³	Operation
Air Quality	<p>During construction / decommissioning, the likely combined effects on air quality are those due to:</p> <ul style="list-style-type: none"> • For all developments, dust-generating construction works; and, • For all developments, emissions from construction plant / equipment / vehicles. 	<p>During operation, the likely combined effects on air quality are those due to:</p> <ul style="list-style-type: none"> • For the Proposed Development, NO_x emissions from the CCGT unit(s) or the CCGT unit and the OCGT unit(s); and, • For the DP World® London Gateway sites, emissions from vehicles.
Noise and Vibration	<p>During construction / decommissioning, the likely combined noise and vibration effects are those due to:</p> <ul style="list-style-type: none"> • For all developments, noise and vibration-generating construction works; and, • For all developments, noise and vibration-generating construction plant / equipment / vehicles. 	<p>During operation, the likely combined noise and vibration effects are those due to:</p> <ul style="list-style-type: none"> • For the Proposed Development, noise and vibration generating plant (the CCGT unit(s) or the CCGT unit and the OCGT unit(s)); and, • For the DP World® London Gateway sites, noise and vibration-generating operational activities.
Landscape and Visual	<p>During construction / decommissioning, the likely combined landscape and visual effects are those due to:</p> <ul style="list-style-type: none"> • For all developments, construction works; • For all developments, the presence of construction plant / equipment / vehicles; and, • For all developments, the use of lighting to ensure that construction personnel can move around safely during the hours of darkness. 	<p>During operation, the likely combined landscape and visual effects are those due to:</p> <ul style="list-style-type: none"> • For the Proposed Development and the DP World® London Gateway sites, the presence of the development.
Ecology	<p>During construction / decommissioning, the likely combined effects on ecology are those due to:</p> <ul style="list-style-type: none"> • For all developments, direct effects, comprising: habitat loss, fragmentation, degradation, damage and / or disturbance; and, species mortality, injury and /or disturbance; and, • For all developments, indirect effects comprising those related to: air quality; noise and vibration; landscape and visual; and, discharges / emissions to land and / or water. 	<p>During operation, the likely combined effects on ground conditions related to the Proposed Development and the DP World® London Gateway sites were largely deemed to be positive due to the clearance and relocation works.</p>
Ground Conditions (Geology and Land Contamination)	<p>During construction / decommissioning, the likely combined effects on ground conditions are those due to:</p> <ul style="list-style-type: none"> • For all developments, potential release of contaminants due to construction activities; and, • For all developments, discharge of pollutants to land. 	<p>During operation, the likely combined effects on ground conditions related to the Proposed Development and the DP World® London Gateway sites were largely deemed to be positive due to the clearance, remediation and levelling works.</p>

⁵³ Should the decommissioning of Proposed Development coincide with the decommissioning of the ancillary developments and other planned projects / developments.

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Aspect	Construction / Decommissioning⁵³	Operation
Water Resources	<p>During construction / decommissioning, the likely combined effects on water resources are those due to:</p> <ul style="list-style-type: none"> • For all developments, discharge of pollutants to water. 	<p>During operation, the likely combined effects on water resources related to the Proposed Development and the DP World® London Gateway sites were largely deemed to be positive due to the clearance, remediation and levelling works.</p>
Transport and Transport Infrastructure	<p>During construction / decommissioning, the likely combined traffic and transport infrastructure effects are those due to:</p> <ul style="list-style-type: none"> • For all developments, short-term additional vehicular traffic on the public highway network. 	<p>During operation, the likely combined traffic and transport infrastructure effects are those due to:</p> <ul style="list-style-type: none"> • For the Proposed Development and the DP World® London Gateway sites, the operational activities.
Historic Environment	<p>During construction / decommissioning, there were limited combined effects on the historic environment due to the previous heavy industrial developments of the sites.</p>	<p>During operation, there were limited combined effects on the historic environment.</p>
Socio-Economics	<p>During construction / decommissioning, the likely combined socio-economics effects for all developments were largely deemed to be positive.</p>	<p>During operation, the likely combined socio-economics effects for the Proposed Development and the DP World® London Gateway sites were largely deemed to be positive.</p>

17.4 Main Respects in which the Likely Significant Effects will Differ

- 17.4.1 Table 17.7 presents the specific questions designed to determine the main respects in which the likely significant cumulative effects of the Proposed Development will differ from those previously described. Where there is identification of a difference, the specific questions are also designed to identify the need, nature and scope of any necessary further updated impact assessment.

TABLE 17.7: MAIN RESPECTS IN WHICH THE LIKELY CUMULATIVE IMPACTS WILL DIFFER

<i>Potential for the Likely Significant Effects on the Environment to Differ</i>		<i>Is there a Need for Further Assessment?</i>	
<i>Question:</i>	<i>Y / N (Briefly Describe)</i>	<i>Y / N (Briefly Describe)</i>	
Will the Proposed Development lead to the interaction of impacts or the potential for cumulative impacts with ancillary developments which differs from those previously described?	N Whilst there are additional ancillary developments associated with the Proposed Development, these are not anticipated to lead to the interaction of impacts or the potential for cumulative impacts which materially differ from those previously described. Indeed, it is not anticipated that the potential effects on the environment of the additional ancillary developments would be materially different from those of the ancillary developments previously described.	N	N / A
Will the Proposed Development lead to the interaction of impacts or the potential for cumulative impacts with other planned projects / developments which differ from those previously described?	N Whilst there are additional other planned projects / developments, with regards to all cumulative effects other than those related to traffic and transport infrastructure, these are not anticipated to lead to the interaction of impacts or the potential for cumulative impacts which materially differ from those previously described. With regards to traffic and transport infrastructure effects, Section 14 (Traffic and Transport Infrastructure) provides further information.	N	N / A

17.5 Summary of the Updated Impact Assessment

Construction / Decommissioning

- 17.5.1 During construction / decommissioning, with regards to all cumulative effects other than those related to traffic and transport infrastructure, the likely significant cumulative effects will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate. With regards to traffic and transport infrastructure effects, Section 14 (Traffic and Transport Infrastructure) provides further information.

Operation

- 17.5.2 During operation, with regards to all cumulative effects other than those related to traffic and transport infrastructure, the likely significant cumulative effects will not materially differ from those previously described, and the assessments contained within the February 2010 ES, the December 2010 ES FID, the August 2014 ES FID and the February 2016 ES FID remain valid and appropriate. With regards to traffic and transport infrastructure effects, Section 14 (Traffic and Transport Infrastructure) provides further information.

17.6 Features and Measures to Avoid, Prevent or Reduce Significant Adverse Effects

- 17.6.1 Section 18 (Consolidated Summary of Mitigation and Monitoring) considers the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects.

18. CONSOLIDATED SUMMARY OF MITIGATION AND MONITORING

18.1 Construction

- 18.1.1 For construction, Table 18.1 provides the consolidated summary of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects. With regards to implementation of these features and measures, wherever relevant, Table 18.1 also provides the associated Conditions of the 2016 Deemed Planning Permission (alongside a description of the proposed 2019 Variation Application variations of these Conditions).

18.2 Operation

- 18.2.1 For operation, Table 18.2 provides the consolidated summary of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects. With regards to implementation of these features and measures, wherever relevant, Table 18.2 also provides the associated Conditions of the 2016 Deemed Planning Permission (alongside a description of the proposed 2019 Variation Application variations of these Conditions).

18.3 Decommissioning

- 18.3.1 As far as possible, for decommissioning, Table 18.3 provides the consolidated summary of the features of the Proposed Development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant effects. With regards to implementation of these features and measures, wherever relevant, Table 18.3 also provides the associated Conditions of the 2016 Deemed Planning Permission (alongside a description of the proposed 2019 Variation Application variations of these Conditions).

TABLE 18.1: CONSTRUCTION MITIGATION AND MANAGEMENT FEATURES / MEASURES

<i>Aspect</i>	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
General Features / Measures	General construction works / activities.	Prepare and implement a CEMP. The objective of the CEMP will be to: <ul style="list-style-type: none"> Identify legal, environmental and other obligations and requirements appropriate to the construction of the Proposed Development; Provide a framework to comply with the identified legal, environmental and other obligations and requirements through appropriate mitigation and monitoring; (Based on the identified mitigation and monitoring measures), provide the basis for setting objectives and targets for construction of the Proposed Development; and, Demonstrate a professional approach to environmental management. 	Condition (25) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a CEMP has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a CEMP associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Comply with the 'normal construction working hours'.	Condition (26) of the 2016 Deemed Planning Permission requires compliance with these working hours. The 2019 Variation Application does not seek to vary this Condition.
		Comply with the 'piling construction working hours'.	Condition (27) of the 2016 Deemed Planning Permission requires compliance with these working hours. The 2019 Variation Application does not seek to vary this Condition.
		Comply with the 'construction working hours where no vehicle movements are permitted'.	Condition (22) of the 2016 Deemed Planning Permission requires compliance with these working hours. The 2019 Variation Application does not seek to vary this Condition.

<i>Aspect</i>	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
		Comply with the 'heavy commercial vehicle movements construction working hours'.	Condition (21) of the 2016 Deemed Planning Permission requires compliance with these working hours. The 2019 Variation Application does not seek to vary this Condition.
Air Quality	General construction works / activities.	<p>Prepare and implement a CEMP. With regards to air quality, the CEMP should include the following measures: This will include the following measures:</p> <ul style="list-style-type: none"> • Assessment of materials for moisture content; • If material is dry, application of water spray onto the working area to suppress dust or treatment with a suitable dust suppressant; • Where excavation faces / trenches are not being worked, if required, sheeting or treating with a suitable dust suppressant; and, • Where finely ground materials are delivered, requiring that these are in bag form or stockpiled in specified locations where the material can be suitably covered; • Monitoring of areas utilised by traffic, and if they are dry, application of water by water bowsers; • Provision of paper-type face masks for all operatives working in areas of dust-generating construction works; and, • Employment of a road sweeping vehicles when required to remove dust and dirt from public roads. 	See Condition (25) of the Deemed Planning Permission.

Aspect	Likely Significant Effect on the Environment	Feature / Measure	Implementation
	Dust-generating construction works, including: earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow Earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow.	Development of and compliance with a scheme employing all reasonable measures for the suppression of dust during the period of construction.	Condition (6) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
	Dust-generating construction works, including: vehicle movements.	Development of and compliance with a scheme for the provision of wheel cleansing facilities for heavy commercial vehicles and any mobile plant which has an operating weight exceeding three tonnes.	Condition (4) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Sheeting of all open bodied heavy commercial vehicles carrying dry loose, aggregate, cement or soil into and / out of the Site.	Condition (7) of the 2016 Deemed Planning Permission requires that all open bodied heavy commercial vehicles carrying dry loose, aggregate, cement or soil into and / out of the Site be sheeted. The 2019 Variation Application does not seek to vary this Condition.

<i>Aspect</i>	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
Noise and Vibration	General construction works / activities.	<p>Prepare and implement a CEMP.</p> <p>With regards to noise and vibration, the CEMP should include the following measures:</p> <ul style="list-style-type: none"> • All construction plant / equipment to be with customary exhaust silencers, and regularly maintained; • All construction plant / equipment to be used where appropriate. All major compressors to be sound-reduced models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers; • All ancillary construction plant / equipment (such as generators, compressors and pumps) to be positioned so as to cause minimum noise disturbance. If necessary, temporary acoustic barriers or enclosures to be provided; and, • To the extent required by Thurrock Borough Council, specific method statements and risk assessments to be produced for night working. 	See Condition (25) of the Deemed Planning Permission.
	Noise and vibration-generating construction works; and, noise and vibration-generating construction plant / equipment / vehicles.	Compliance with BS 5228:2009 + A1 2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: Noise and Part 2: Vibration).	<p>Condition (29) of the 2016 Deemed Planning Permission requires compliance with BS 5228:2009 + A1 2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: Noise and Part 2: Vibration).</p> <p>The 2019 Variation Application does not seek to vary this Condition.</p>

<i>Aspect</i>	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
		Development and implementation of a 'Noise Complaints Procedure'.	Condition (33) of the 2016 Deemed Planning Permission requires the development and implementation of a 'Noise Complaints Procedure'. The 2019 Variation Application does not seek to vary this Condition.
Landscape and Visual	General construction works / activities, including: <ul style="list-style-type: none"> • Construction works; • The presence of construction plant / equipment / vehicles; and, • The use of lighting. 	Prepare and implement a CEMP. With regards to landscape and visual, the CEMP should include the following measures: <ul style="list-style-type: none"> • Careful placement of the temporary storage of topsoil and any other material considered of value for retention; and, • Careful design and layout of site construction areas including the location and type of temporary security fencing and lighting. 	See Condition (25) of the Deemed Planning Permission.
Ecology	General construction works / activities.	Prepare and implement a CEMP.	See Condition (25) of the Deemed Planning Permission.
Ground Conditions (Geology and Land Contamination)	Release of contaminants due to construction activities across the Proposed Development site; and, discharges of pollutants to land.	Development of and compliance with a scheme to deal with the risks associated with the contamination of the site, including: <ul style="list-style-type: none"> • A Preliminary Risk Assessment; • If required, a Site Investigation Scheme; • If required, a Method Statement for any additional remediation; and, • If required, a Verification Plan. 	Condition (45) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

<i>Aspect</i>	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
		For any additional remediation, preparation of Verifications Report(s).	Condition (47) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a Verification Report has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a Verification Report associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Development of and compliance with a scheme in the event of unexpected contamination.	Condition (33) of the 2016 Deemed Planning Permission requires the development and implementation of a scheme in the event of unexpected contamination. The 2019 Variation Application does not seek to vary this Condition.
Water Resources and Flood Risk	Discharges of pollutants to water.	Development of and compliance with a scheme detailing the method and working of drainage facilities.	Condition (35) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Use of oil / grit interceptors for any surface waters contaminated by hydrocarbons.	Condition (37) of the 2016 Deemed Planning Permission requires the use of oil / grit interceptors. The 2019 Variation Application does not seek to vary this Condition.

<i>Aspect</i>	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
		Storage of hydrocarbon / process chemicals / similar liquids on impervious bases, or surrounded by impervious bunds, with the size at least equipment to the capacity of the largest tank plus 10%.	Condition (37) of the 2016 Deemed Planning Permission requires the storage of hydrocarbon / process chemicals / similar liquids on impervious bases, or surrounded by impervious bunds, with the size at least equipment to the capacity of the largest tank plus 10%. The 2019 Variation Application does not seek to vary this Condition.
Transport and Transport Infrastructure	Short-term additional vehicular traffic on the public highway network (links and junctions within the study area).	Development of and compliance with a Transport Management Plan.	Condition (23) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a Transport Management Plan has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a Transport Management Plan associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Development of and compliance with a scheme for the monitoring of traffic movements.	Condition (14) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

<i>Aspect</i>	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
		Development of and compliance with a scheme detailing the route(s) which traffic would take to and from the Site.	Condition (24) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Investigation into the use of water for the delivery of construction plant / equipment / materials.	Condition (15) of the 2016 Deemed Planning Permission requires that the construction of the Proposed Development not take place until the results of the investigation have been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that construction of a specified phase of the Proposed Development not take place until the results of the investigation associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council.

<i>Aspect</i>	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
		Investigation into the use of rail for the delivery of construction plant / equipment / materials.	Condition (17) of the 2016 Deemed Planning Permission requires that the construction of the Proposed Development not take place until the results of the investigation have been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that construction of a specified phase of the Proposed Development not take place until the results of the investigation associated with the specified phase of the Proposed Development have been submitted to and approved in writing by Thurrock Borough Council.
Historic Environment	Potential for construction works / activities to damage and / or disturb unknown buried archaeological features.	Development of and compliance with a scheme of archaeological investigation and associated implementation programme.	Condition (42) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
Socio-Economics	Direct positive effects due to short-term employment opportunities; and, indirect / secondary positive effects due to increases in the use of local services and businesses.	N / A	N / A

TABLE 18.2: OPERATION MITIGATION AND MANAGEMENT FEATURES / MEASURES

	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
General Features / Measures	General operational works / activities.	During operation, activities on the GEC site will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016. GECL already holds an Environmental Permit for the development permitted by the 2014 Varied Consent (EPR/EP3536EN) issued in July 2016. Based on the Development Option selected, an application to vary this Environmental Permit will be made in due course. In addition, regarding emissions of CO ₂ , the Proposed Development will be required to apply for an EU Emissions Trading Scheme (ETS) Permit. The scheme is currently operating in Phase III, which runs from 1 January 2013 to 31 December 2020. Phase IV will run from 1 January 2021 to 31 December 2030.	
Air Quality	NO _x emissions from the Proposed Development (the CCGT unit(s) or the CCGT unit and OCGT unit(s)).	The following features / measures will be included in the design of the CCGT unit(s) or the CCGT unit and the OCGT unit(s): <ul style="list-style-type: none"> • Dry Low NO_x Combustion Technology; and, • A use of a stack of sufficient height and flue gases of sufficient temperature and velocity to ensure good dispersion. 	Design of the Proposed Development.
		Development of and compliance with a scheme for the monitoring of NO _x in the area.	Condition (55) of the 2016 Deemed Planning Permission requires that commissioning of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commissioning of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
Noise and Vibration	The use of noise and vibration-generating plant within the Proposed Development (the CCGT unit(s) or the CCGT unit and OCGT unit(s)).	<p>The following features / measures will be included in the design of the CCGT unit(s) or the CCGT unit(s) and the OCGT unit(s):</p> <ul style="list-style-type: none"> • Silencers to be fitted to achieve noise attenuation on specific plant / equipment items, including gas turbine and HRSG inlets and ductwork; • Acoustic lagging and low noise trims to be fitted to specific pipework and noise generating steam valves where required; • Acoustic enclosures to be considered, and provided where required, for all plant / equipment items where practicable, including for smaller plant items such as compressors and pumps; • Where required, internal surfaces within the turbine hall to be treated to control internal reverberant noise levels. An appropriate treatment would consist of dense mineral wool panel behind perforated sheet steel, or a spray on cellulose fibre treatment; • Although 'normally-off' plant / equipment items have not been included in the modelling of normal operation, these to be afforded the same level of noise control as all other plant / equipment items as appropriate; and, • As tonal or impulsive noises are considered more annoying than continuous noise sources, plant / equipment items to be silenced or otherwise controlled through regular maintenance. 	Design of the Proposed Development.

	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
		Development of and compliance with a scheme for the monitoring and control of noise generated by the normal commercial operation.	Condition (30) of the 2016 Deemed Planning Permission requires that commissioning of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commissioning of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Development and implementation of a 'Noise Complaints Procedure'.	Condition (33) of the 2016 Deemed Planning Permission requires the development and implementation of a 'Noise Complaints Procedure'. The 2019 Variation Application does not seek to vary this Condition.
Landscape and Visual	The presence of the Proposed Development.	Development of and compliance with a scheme including provisions for the layout and design. In particular:	Conditions (8) to (11) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
		<p>Development of and compliance with a scheme of landscaping. The landscaping scheme for GEC shall consider:</p> <ul style="list-style-type: none"> • The provision of additional ponds on site. These could be designed in particular for amphibians and aquatic invertebrates but would also provide value for a variety of bird species. • The use of a locally appropriate species-rich grass seed mix for the grassland surrounding the GEC. • The provision of landscape planting, in particular any screen planting, which would provide new habitat for nesting birds and terrestrial invertebrate species as well as providing new features of value to foraging and commuting bats. • The provision of bird nesting boxes on buildings within the area to immediately increase the availability of nesting habitat on site. <p>The associated landscaping management plan shall also consider:</p> <ul style="list-style-type: none"> • Low frequency, ecologically sensitive grass cutting to allow grass and flora species to flower and set seed. • Recommendations for the drainage features and any ponds provided on site. 	<p>Condition (50) of the 2016 Deemed Planning Permission requires that commissioning of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commissioning of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.</p>

	Likely Significant Effect on the Environment	Feature / Measure	Implementation
Ecology	General operational works / activities.	Development of and compliance with a scheme of Environmental Enhancement Measures (incorporating a management plan).	Condition (54) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme (incorporating a management plan) has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
			In addition, following discussion with Natural England, InterGen / GECL has agreed to: <ul style="list-style-type: none"> • Provide an ecologist for 1 – 2 days per year over a 5 year term to monitor mitigation works to regenerate acid grassland at Thundersley Great Common SSSI; and, • Participate in a new Project to increase the population of Least Lettuce (<i>Lactuca saligna</i>) species at Vange and Fobbing Marshes SSSI.
Ground Conditions (Geology and Land Contamination)	General operational works / activities.	The following features / measures will be included in the design of GEC: <ul style="list-style-type: none"> • All foundations will be appropriately specified to resist chemical attack from soils or groundwater; and, • All foundations will be designed so as not to present a preferential pathway for contamination migration. 	Design of the Proposed Development.

	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
Water Resources and Flood Risk	Discharges of pollutants to water.	Development and implementation of a scheme for sustainable drainage.	Condition (34) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
Transport and Transport Infrastructure	Long-term additional vehicular traffic on the public highway network (links and junctions within the study area).	Development of and compliance with a Travel Plan.	Condition (13) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a Travel Plan has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.
		Development of and compliance with a scheme for the monitoring of traffic movements.	Condition (14) of the 2016 Deemed Planning Permission requires that commencement of the Proposed Development not take place until a scheme has been submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that commencement of a specified phase of the Proposed Development not take place until a scheme associated with the specified phase of the Proposed Development has been submitted to and approved in writing by Thurrock Borough Council.

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	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
Historic Environment	N / A	N / A	N / A
Socio-Economics	Direct positive effects due to long-term employment opportunities; and, indirect / secondary positive effects due to increases in the use of local services and businesses.	N / A	N / A

TABLE 18.3: DECOMMISSIONING MITIGATION AND MANAGEMENT FEATURES / MEASURES

	<i>Likely Significant Effect on the Environment</i>	<i>Feature / Measure</i>	<i>Implementation</i>
General Features / Measures	General construction works / activities.	<p>Prepare and implement a DEMP. The objective of the DEMP will be to:</p> <ul style="list-style-type: none"> • Identify legal, environmental and other obligations and requirements appropriate to the decommissioning of the Proposed Development; • Provide a framework to comply with the identified legal, environmental and other obligations and requirements through appropriate mitigation and monitoring; • (Based on the identified mitigation and monitoring measures), provide the basis for setting objectives and targets for decommissioning of the Proposed Development; and, • Demonstrate a professional approach to environmental management. 	<p>Condition (56) of the 2016 Deemed Planning Permission requires that within 6 months of the Proposed Development ceasing to be used for the purposes of electricity generation, a DEMP be submitted to and approved in writing by Thurrock Borough Council. The 2019 Variation Application seeks to vary this Condition to require that within 6 months of a specified phased of the Proposed Development ceasing to be used for the purposes of electricity generation, a DEMP associated with the specified phase of the Proposed Development be submitted to and approved in writing by Thurrock Borough Council.</p>