

# **HIGH VOLTAGE ELECTRICAL CONNECTION**



# **ENVIRONMENTAL REPORT**

**Prepared by** 



November 2012



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### SCREENING OPINION FROM THURROCK BOROUGH COUNCIL

### APPENDIX B

SUMMARISING CORRESPONDANCE FROM CONSULTATION WITH KEY STAKEHOLDERS

### LIST OF ABBREVIATIONS

ACC	Air Cooled Condenser
AGI	Above Ground Installation
AIS	Air Insulated Switchgear
BAP	Biodiversity Action Plan
CCGT	Combined Cycle Gas Turbine
CCR	Carbon Capture Readiness
CCS	Carbon Capture and Storage
CECL	Coryton Energy Company Limited
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CO <sub>2</sub>	Carbon Dioxide
CRoW	Countryside and Rights of Way Act 2000
CTMP	Construction Transport Management Plan
DECC	Department for Energy and Climate Change
DWS	District Wildlife Site
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
ES	Environmental Statement
ES FID	Environmental Statement Further Information Document
FCMS	Framework Construction Management Strategy
GCN	Great Crested Newts
GCN GEC	Great Crested Newts Gateway Energy Centre
GCN GEC GECL	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited
GCN GEC GECL GIS	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear
GCN GEC GECL GIS HDD	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling
GCN GEC GECL GIS HDD HEO	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order
GCN GEC GECL GIS HDD HEO HGV	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle
GCN GECL GIS HDD HEO HGV HMP	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan
GCN GEC GECL GIS HDD HEO HGV HMP HRSG	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator
GCN GEC GECL GIS HDD HEO HGV HMP HRSG HV	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage
GCN GECL GIS HDD HEO HGV HMP HRSG HV IEEM	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management
GCN GEC GECL GIS HDD HEO HGV HMP HRSG HV IEEM KV	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management kiloVolt
GCN GECL GIS HDD HEO HGV HMP HRSG HV IEEM KV L BAP	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management kiloVolt Local Biodiversity Action Plan
GCN GECL GIS HDD HEO HGV HMP HRSG HV IEEM kV L BAP LCV	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management kiloVolt Local Biodiversity Action Plan Lower Calorific Value
GCN GECL GIS HDD HEO HGV HMP HRSG HV IEEM kV L BAP LCV LG	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management kiloVolt Local Biodiversity Action Plan Lower Calorific Value London Gateway
GCN GECL GIS HDD HEO HGV HMP HRSG HV IEEM kV L BAP LCV LG LNR	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management kiloVolt Local Biodiversity Action Plan Lower Calorific Value London Gateway Local Nature Reserve
GCN GECL GIS HDD HEO HGV HMP HRSG HV IEEM kV L BAP LCV LG LNR MNR	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management kiloVolt Local Biodiversity Action Plan Lower Calorific Value London Gateway Local Nature Reserve
GCN GECL GIS HDD HEO HGV HMP HRSG HV IEEM kV L BAP LCV LG LNR MNR MWe	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management kiloVolt Local Biodiversity Action Plan Lower Calorific Value London Gateway Local Nature Reserve Marine Nature Reserve
GCN GECL GIS HDD HEO HGV HMP HRSG HV IEEM kV L BAP LCV LG LNR MNR MWe NERC	Great Crested Newts Gateway Energy Centre Gateway Energy Centre Limited Gas Insulation Switchgear Horizontal Directional Drilling Harbour Empowerment Order Heavy Good Vehicle Health Management Plan Heat Recovery Steam Generator High Voltage Institute of Ecological and Environmental Management kiloVolt Local Biodiversity Action Plan Lower Calorific Value London Gateway Local Nature Reserve Marine Nature Reserve MegaWatts Electrical

NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OPA	Outline Planning Application
OS	Ordnance Survey
PP	Planning Permission
RCP	Rotating Centre Post
SAC	Special Area of Conservation
SEE	Spalding Energy Expansion
SEEL	Spalding Energy Expansion Limited
SINC	Site of Importance for Nature Conservation
SINS	Site of Importance for Natural Site
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TTGDC	Thurrock Thames Gateway Development Corporation
TWAO	Transport and Works Act Order
UK BAP	United Kingdom Biodiversity Action Plan
VER	Valued Ecological Receptor
WCA	Wildlife and Countryside Act 1981
WFD	Water Framework Directive

### 1 INTRODUCTION

### 1.1 Overview

- 1.1.1 This Document is an Environmental Report which accompanies an application for Planning Permission under the Town and Country Planning Act 1990 made by Gateway Energy Centre Limited (GECL) to Thurrock Borough Council (the Council).
- 1.1.2 The application for Planning Permission is in respect of a proposal by GECL to install a High Voltage (HV) Electrical Connection, linking the approved Gateway Energy Centre (GEC) (situated on land within the London Gateway (LG) Port / LG Logistics and Business Park, collectively called the LG Development) with an extension of the existing National Grid Coryton South Substation (the Proposed Development).

### 1.2 The Proposed Development

### Overview

- 1.2.1 The infrastructure for the HV Electrical Connection will comprise:
  - A connection to the GEC Substation within the GEC site;
  - An underground and culverted<sup>1</sup> double circuit 400 kV cable system from the GEC Substation to the National Grid Coryton South Substation; and,
  - The extension of the National Grid Coryton South Substation within the existing CECL Power Station site.
- 1.2.2 The Proposed Development has significant advantages over the previous HV Electrical Connection options that were considered by GECL<sup>2</sup>. These significant advantages include:
  - No new Substation which could have been located at Mucking Flats within the Green Belt or within designated Employment Land;
  - No requirement for new overhead transmission lines and associated sealing end compounds; and,
  - Shorter length of HV Electrical Connection.

### Application Site

- 1.2.3 The Application Site (i.e. the area where the proposed development will take place) for the HV Electrical Connection is shown in Figure 1.
- 1.2.4 Within the Application Site, the route of the underground and culverted double circuit 400 kV cable system would:
  - Leave the GEC Substation within the GEC site, and exit the GEC site to the east, and then turn northwards following the route of the agreed easement with DP World;
  - Likely require a Horizontal Directional Drill (HDD) under the A1014 (The Manorway);

<sup>&</sup>lt;sup>1</sup> The HV Electrical Connection may include a culverted section. For example, within the LG Development site a culverted section may be incorporated for crossing of the railway line.

<sup>&</sup>lt;sup>2</sup> These options were considered in the Environmental Statement 2010 and Environmental Statement Further Information Document 2010 which were prepared to accompany the application to the Department of Energy and Climate Change for Consent under Section 36 of the Electricity Act 1989 for GEC, and the Environmental Statement 2011 and Environmental Statement Further Information Document 2011 which were prepared to accompany the application to Thurrock Thames Gateway Development Corporation for Planning Permission under the Town and Country Planning Act 1990 for the Underground Gas Pipeline and Associated Above Ground Installation. Electronic versions of these applications and associated documents can be downloaded free of charge at the GEC website: <u>http://www.gatewayenergycentre.co.uk</u>

- Turn eastwards towards the existing CECL Power Station;
- Likely require a second HDD back under the A1014 (The Manorway); and
- Continue south-eastwards towards the Coryton South Substation at the existing CECL Power Station.

### **Options Considered**

- 1.2.5 Within the Application Site, two Options are considered. These are referred to in this Environmental Report as the 'Preferred Option' and the 'Manorway Fleet / Northern Triangle Option'.
- 1.2.6 The exact route of the 400 kV cable system within the Application Site has yet to be determined. This will be determined after the appointment of the Construction Contractor / Horizontal Directional Drilling (HDD) Specialist, who will take into consideration the potential locations for the HDD drilling pits and agreements with land owners.

### Preferred Option

1.2.7 The 'Preferred Option' is shown in Figures 1A to 1D (taken from Atkins Figures 5088247/09.01/1005 to 5088247/09.01/1002), as being immediately to the north of the A1014 (The Manorway) where it is proposed to install the HV Electrical Connection under the cycle path.

### Manorway Fleet / Northern Triangle Option

- 1.2.8 The 'Manorway Fleet / Northern Triangle Option' would be employed in the event that it is not practicable to install the HV Electrical Connection under the cycle path. Under this Option it may be necessary to extend the working corridor northwards into the Manorway Fleet and the Northern Triangle (Receptor Site associated with the LG Development).
- 1.2.9 If the working corridor is to be extended northwards, access will be required into this area of open land. Accordingly, the Application Site (shown in Figure 1) incorporates the use of an existing access track.

### Permanent Operational Structures

- 1.2.10 Following construction / installation, the route of the HV Electrical Connection (i.e. the 400 kV cable system) will be permanently buried or culverted along its entire length. However, there will also be a number of permanent operational structures, including the following:
  - The extension to the existing National Grid Coryton South Substation (the proposed indicative layout and elevations can be seen in Figure 2);
  - Joint bays (or transitional bays) (which will be installed at HDD drilling sites and also at locations where joints in the 400 kV cable system would be required); and,
  - Marker posts / plates (which will be installed where the 400 kV cable system runs across or alongside a railway; runs across a road; runs across agricultural land; changes direction; and, has joint positions).

### 1.3 Structure of this Environmental Report

- 1.3.1 This Document comprises:
  - **Section 1** This brief Introduction.
  - Section 2 The Purpose and Scope of this Environmental Report.

- **Section 3** Development Proposals associated with the HV Electrical Connection.
- Section 4 The HV Electrical Connection.
- **Section 5** Construction, Operation and Decommissioning.
- Section 6 The Likely Environmental Impacts of the HV Electrical Connection.
- Section 7 Framework for a Construction Environmental Management Plan.
- Section 8 Ecological Impact Assessment.
- Section 9 Water Resources Assessment.
- Section 10 Indirect / Secondary and Cumulative Impacts.

1.3.2 Supporting Information is provided in the Appendices, which comprise:

- Appendix A Screening Opinion from Thurrock Borough Council.
- *Appendix B* Summarising Correspondence from Consultation with Key Stakeholders.

2 THE PURPOSE AND SCOPE OF THE ENVIRONMENTAL REPORT

### 2.1 Screening of the HV Electrical Connection

2.1.1 Regulation 5(1) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (the 2011 Environmental Impact Assessment (EIA) Regulations) states:

"A person who is minded to carry out development may request the relevant planning authority to adopt a screening opinion".

- 2.1.2 Accordingly, a Request for a Screening Opinion was submitted to the Council in June 2012.
- 2.1.3 The Request for a Screening Opinion was accompanied by a Screening Report, which presented the results of a Screening Process.
- 2.1.4 In undertaking the Screening Process, a 'Checklist for Screening' was completed. The 'Checklist for Screening' was design to aid the decision as to whether an EIA was required based on the characteristics of the development and its interactions which the surrounding environment.
- 2.1.5 Accordingly, the 'Checklist for Screening' provided a list of questions such that there could be an identification of where there was a potential for the HV Electrical Connection to interact with the surrounding environment, and therefore subsequent identification of where there was a potential for the HV Electrical Connection to have an environmental impact. If there was a potential for the HV Electrical Connection to have an environmental impact, the 'Checklist for Screening' allowed for the identification of whether this was likely to be significant.
- 2.1.6 The 'Checklist for Screening' was completed in line with the European Commission Document "Guidance on EIA Screening" (June 2001) (the Screening Guidance), and in particular the provisions in "Section B4: Case-by-Case Screening Tools".
- 2.1.7 The conclusion reached as a result of completing the 'Checklist for Screening' was that the proposed development of the HV Electrical Connection was not likely to have significant impacts on the environment. However, in completing the 'Checklist for Screening', it was indicated that further information relating to Ecology and Water Resources would need to be submitted with the application for Planning Permission. A summary of these relevant conclusions (which referred to the need for further information relating to Ecology and Water Resources) is provided in Table 2.1.

TABLE 2.1: SUMMARY OF OUTSTANDING COMMENTS FROM THE 'CHECKLIST FOR SCREENING'

	Questions to be Considered	Y / N / Briefly	? Describe	ls this l. Effect? Y / N / ? Why?	ikely to result in a Significant Environmental
12.	Are there any 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) which could be affected by the Project?	>	The route of the HV Electrical Connection may cross areas which are important / sensitive for reasons of their ecology (although not Statutory Designated Sites).	z	It is likely that none of the construction works will be within the Northern Triangle (Receptor Site associated with the LG Development). However, if construction work is required within the Northern Triangle (i.e. drilling sites for HDD and / or HDD), a CEMP (and specific Phase 2 Protected Species Method Statements) will be in place to mitigate and minimise impacts (which would be temporary). Consequently no sites which are important / sensitive for reasons of their ecology would be permanently affected by the HV Electrical Connection, and there will not be any permanent significant environmental effects. This will be confirmed in an Ecological Assessment to be submitted with the application.

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	Questions to be	Y/N/	2	Is this Effect?	likely to result in a Significant Environmental
	Considered	Briefly	Describe	Y/N/ Why?	2
<u>13</u>	Are there any areas on or around the site which are used by protected /	$\prec$	The route of the HV Electrical Connection may cross areas which are likely to be used by protected / important / sensitive species of fauna	z	It is likely that none of the construction works will be within the Northern Triangle (Receptor Site associated with the LG Development).
	important / sensitive species of fauna or flora (e.g. for breeding / nesting / foraging / resting / overwintering / migration) which could be affected by		or flora.		However, if construction work is required within the Northern Triangle (i.e. drilling sites for HDD and / or HDD), a CEMP (and specific Phase 2 Protected Species Method Statements) will be in place to mitigate and minimise impacts (which would be temporary).
					For other areas, Habitat Surveys and Protected Species Surveys would be undertaken prior to construction works commencing on site. Areas with the potential to support Habitat or areas where Protected Species are known to occur will
					be avoided where possible. Removal of habitat will not occur during the breeding season. A CEMP (and specific Phase 2 Protected Species
					Method Statements) will be in place to mitigate and minimise impacts (which would be temporary).
					Consequently no sites which support protected / important / sensitive species of fauna or flora would be permanently affected by the HV Electrical Connection and there will not be any
					permanent significant environmental effects. This will be confirmed in an Ecological Assessment to be submitted with the application.
					Assessment to be submitted with the application.

GEC HV Electrical Connection – Environmental Report November 2012

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	Questions to be Considered	Y / N / : Briefly	Pescribe	ls this l Effect? Y / N / ? Why?	ikely to result in a Significant Environmental
4.	Are there any inland / coastal / marine / underground waters on or around the site which could be affected by the Project?	>	The route of the HV Electrical Connection passes close to the Manorway Fleet.	z	It is likely that none of the final build will be within the Manorway Fleet. However, if construction work is required within the Manorway Fleet (i.e. HDD), a CEMP will be in place to mitigate and minimise impacts (which would be temporary). Therefore no waters would be permanently affected by the HV Electrical Connection. This will be confirmed in a Water Resources Assessment to be submitted with the application.
27.	Is the Project site susceptible to earthquakes / subsidence / landslides / erosion / flooding or extreme or adverse climatic conditions (e.g. temperature inversions / fogs / severe winds) which could cause the Project to present environmental problems?	>	The locations of the proposed Substations fall within an area which is designated by the Environment Agency as a Flood Zone 3.	z	Modelling work undertaken on the Section 36 Consent application for GEC (Supplementary Flood Risk Assessment) has shown that the location of the proposed Substations will not be at Flood Risk. This will be confirmed in a Water Resources Assessment to be submitted with the application.

2.1.8 Accordingly, the conclusion of the Screening Report stated that (Paragraphs 6.1.1):

"It is considered that the Proposed Development would not have significant environmental effects, and should not be considered EIA Development under the 2011 EIA Regulations.

However, it is recognised that some supplementary information is provided with the application.

A number of meetings with Key Stakeholders were held to determine the scope of this supplementary information to be provided with the application.

As such, it is intended that the following supplementary information is provided with the application<sup>3</sup>:

- Planning Statement;
- Ecological Assessment;
- Water Resources Assessment; and,
- Construction Environmental Management Plan".
- 2.1.9 A Screening Opinion was subsequently received from Thurrock Council in July 2012. The Screening Opinion is contained in Appendix A. The Screening Opinion concluded that:

"On the basis of the submitted request, the Council considered that the proposed development will not be so significant in the location proposed as to require the submission of an EIA. The conclusion is that the proposal is a Schedule 2 Development [under the 2011 EIA Regulations], but **DOES NOT** require an EIA".

### 2.2 Purpose and Scope of the Environmental Report

- 2.2.1 The purpose of this Environmental Report is to provide the supplementary information referred to in the Screening Report. Accordingly, and based on the results of the Screening Process this Environmental Report is of limited scope and contains:
  - A summary of the likely Environmental Impacts of the HV Electrical Connection;
  - A Framework for a Construction Environmental Management Plan (i.e. the requirements of any Construction Environmental Management Plan);
  - An Ecological Assessment (to confirm the results of the Screening Process);
  - A Water Resources Assessment (to confirm the results of the Screening Process); and,
  - An Indirect / Secondary and Cumulative Impact Assessment.

### Additional / Further Consultation on the HV Electrical Connection

- 2.3.1 In addition to the consultation with Key Stakeholders, InterGen / GECL held a fourth round of consultation events regarding GEC to update Local Residents / Stakeholders on recent developments.
- 2.3.2 The fourth round of consultation events focussed primarily on the 'Preferred Option' for the route of the HV Electrical Connection.
- 2.3.3 The fourth round of consultation events comprised two Public Exhibitions. These were as follows:

2.3

<sup>&</sup>lt;sup>3</sup> The proposals for the supplementary information to be submitted has been developed through consultation with Natural England (with regards to the Ecological Assessment), the Environment Agency (with regards to the Water Resources Assessment) and Essex County Council (with regards to the need, or otherwise, for a Cultural Heritage / Archaeological Assessment). Summarising Correspondence from Consultation with Key Stakeholders is included in Appendix B.



Thursday 12 July 2012	Friday 13 July 2012
1 pm to 8 pm	1 pm to 5 pm
East Thurrock Community Association	The Corringham Hall
77 Corringham Road,	Springhouse Road,
Stanford le Hope,	Corringham,
SS17 0NU	SS17 7LE

- 2.3.4 Prior to the Public Exhibitions, quarter page adverts were placed in two local newspapers inviting local residents to attend. These were as follows:
  - Yellow Advertiser (Thurrock Edition) (on Thursday 5 July 2012); and,
  - Thurrock Gazette (on Friday 6 July).
- 2.3.5 In addition, a letter was sent to over 280 Local Stakeholders on 6 July. The Local Stakeholders included Members / Officers from Thurrock Borough Council and the surrounding District and County Councils. The same letter was also sent to Local Community Councils and other Local Interest Groups surrounding the GEC site.
- 2.3.6 Furthermore, A3 Posters were placed in a variety of local information points the week before the Public Exhibitions. A press release was issued to the local media (editorial and broadcast) on 4 July.
- 2.3.7 Information boards about the GEC as a whole were on display at the Public Exhibitions.
- 2.3.8 Around 20 people attended the Public Exhibitions. This included the MP Stephen Metcalfe and two Ward Councillors (Corringham and Fobbing) Mark Coxhall and Andrew Roast. The visitors that attended and completed a questionnaire stated that they were pleased that the HV Electrical Connection would now be predominantly underground.
- 2.3.9 A Newsletter was produced and this too was available at the Public Exhibitions. Following the Public Exhibitions, the Newsletter was sent to the 280 Local Stakeholders.

### 3 DEVELOPMENT PROPOSALS ASSOCIATED WITH THE HV ELECTRICAL CONNECTION

### 3.1 Gateway Energy Centre

- 3.1.1 In February 2010, GECL submitted an application to the Department of Energy and Climate Change (DECC) for Consent under Section 36 of the Electricity Act 1989 and for deemed planning permission under Section 90 of the Town and Country Planning Act 1990 (as amended) to construct a Combined Cycle Gas Turbine (CCGT) Power Plant to be known as Gateway Energy Centre or GEC.
- 3.1.2 The GEC site is located on land within the LG Port / LG Business and Logistics Park, collectively known as the LG Development, being promoted by DP World. The LG Development is currently in the early stages of construction.
- 3.1.3 The GEC site is situated on the north bank of the Thames Estuary and lies approximately 6 km east of the A13. The A1014 dual carriageway (The Manorway) is located to the north of the site and runs east to west to provide a link with the A13, which in turn links in with the M25 at Junction 30. The River Thames runs in a west to east direction to the south of the LG Development.
- 3.1.4 The Ordnance Survey (OS) Grid Reference of the centre of the GEC site is approximately 573209, 182165.
- 3.1.5 The nearest residential settlements to the GEC site are at Corringham and Fobbing which lie approximately 4 km to the west, Canvey Island approximately 5 km to the east, and Basildon approximately 7 km to the north.
- 3.1.6 To the east of the GEC site is the existing CECL CCGT Power Plant (700 m east), Shell Aviation Fuel Storage Farm and Petroplus' Coryton Oil Refinery (950 m east).
- 3.1.7 When operational, GEC will provide up to 900 megawatts electrical (MWe) of generation capacity, including the provision of up to 150 MWe to the LG Development to meet its long term electricity requirements.
- 3.1.8 Additionally, GEC will be designed in such a way as to enable the supply of heat in the form of steam and / or hot water (for use in production / space heating / cooling) to facilities and / or customers in the vicinity of the GEC site (in particular to prospective customers of the LG Development).
- 3.1.9 Section 36 Consent for GEC was granted in August 2011.
- 3.2 Underground Gas Pipeline and Associated AGI
- 3.2.1 Further to the development of GEC, 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 in connection with the development of GEC.
- 3.2.2 Planning Permission for the underground gas pipeline and associated AGI was granted in March 2012.

### 3.3 Proposed Programme

- 3.3.1 GEC will have an operational life in the order of 35 years.
- 3.3.2 The proposed programme considered comprises:
  - Construction Late 2013 / Early 2014;
  - Connection and Commissioning 2016; and,
  - Full Operation 2017.



- 3.4 **Previous Application Documentation**
- 3.4.1 Electronic versions of the applications and associated documents can be downloaded free of charge at the GEC website:

http://www.gatewayenergycentre.co.uk

for InterGen

### 4 THE HV ELECTRICAL CONNECTION

### 4.1 Background

- 4.1.1 National Grid has agreed to connect GEC to the National Grid Electricity National Transmission System. In order to do this, new electricity infrastructure is needed.
- 4.1.2 Following extensive studies and consultation, the option for connecting GEC to the National Grid Electricity National Transmission System will comprise a HV Electrical Connection from GEC to the existing Coryton South Substation at the CECL Power Station.
- 4.1.3 This option (as described in this Environmental Report) has significant advantages over previous options which have been considered. These significant advantages include:
  - No new Substation (which could have been located at Mucking Flats within the Green Belt or within designated Employment Land);
  - No requirement for new overhead transmission lines and associated sealing end compounds; and,
  - Shorter length of HV Electrical Connection.

### 4.2 Alternatives: Underground Cable System versus Overhead Line Connection Options

- 4.2.1 When considering alternatives for the HV Electrical Connection, it is first necessary to determine whether the connection would be via an underground cable system or overhead line.
- 4.2.2 These options (i.e. underground cable system versus overhead line) were evaluated based on a qualitative analysis of their strengths and weaknesses. The evaluation considered factors including: technical; planning; land ownership; environmental; and, cost. Table 4.1 presents a summary of the qualitative analysis for an underground cable system versus overhead line.
- 4.2.3 Based on Table 4.1, an underground cable system is the preferred connection option.

# TABLE 4.1: QUALITATIVE ANALYSIS OF UNDERGROUND CABLE SYSTEM VERSES OVERHEAD LINE CONNECTION OPTIONS

Factor	Underground Cable System	Overhead Line			
	Similar number of advantages / disadvantages to both options (provided below). Therefore, there is no preferred connection option.				
Technical	<ul> <li>Congested routes.</li> <li>Underground cable system would be manufactured to order.</li> </ul>	<ul> <li>Cannot pass directly over the tanks at the Shell Tank Farm.</li> <li>Likely that deep foundations will be required due to poor ground conditions.</li> </ul>			
Planning	An underground cable system will like and Country Planning Act 1990 (as an overhead line would require a Develo 2008 from the National Infrastructure Seeking Planning Permission under	ly require Planning Permission under the Town nended) from the Local Planning Authority. An opment Consent Order under the Planning Act Directorate within the Planning Inspectorate. the Town and Country Planning Act 1990 (as			
	amended) will likely be more time efficient. Therefore, an underground cable system is the preferred connection option.				
Land Ownership	Based on a similar routing of the underground cable system and overhead line (and the experience with the underground gas pipeline), it is likely that an underground cable system in this location will be viewed more favourably than an overhead line. Therefore, an underground cable system is the preferred connection option.				
Environmental	Based on a similar routing of the underground cable system and overhead line, there are likely to be more significant adverse landscape and visual impacts associated with an overhead line. Therefore, an underground cable system is the preferred connection option.				
Cost	Due to the existing infrastructure in the areas between the GEC Substation and the Coryton South Substation, it is likely that an underground cable system would be cheaper.				
Summary	Most Preferred	Least Preferred			

### 4.3 Alternatives: Underground Cable System Route Options

4.3.1 Initial routing work undertaken for the underground cable system indicated that there were three potential routes options, shown on Insert 4.1.







<sup>&</sup>lt;sup>4</sup> Please note that this Figure shows the 'first pass' at routing for the purposes of studying the potential alternatives.

- 4.3.2 Of these three routes, the Shell Tank Farm Route was immediately discounted as there is insufficient space.
- 4.3.3 Therefore the two routes further considered were the:
  - <u>Northern Route; and</u>

The route would exit the GEC site to the east, and then turn northwards following the route of the agreed easement with DP World.

The route would likely require a Horizontal Directional Drill (HDD) under the A1014 (The Manorway), and then turn eastwards towards the existing CECL Power Station. The route would then turn south-eastwards and likely require a second HDD back under the A1014 (The Manorway).

The route would then continue south-eastwards towards the Coryton South Substation at the existing CECL Power Station.

Southern Route.

The route would exit the GEC site to the east, and then turn southwards likely requiring a HDD under the Thames Haven Branch Line (Freight Railway Line).

The route would then turn eastwards towards the existing CECL Power Station.

After passing the south of the Shell Tank Farm, the route would turn northeastwards, likely required a second HDD under the Thames Haven Branch Line (Freight Railway Line).

The route would then continue north-eastwards, across the Petroplus Heavy Goods Vehicle (HGV) Parking Area towards the Coryton South Substation at the existing CECL Power Station.

### Comparison

- 4.3.4 The route options (i.e. the Northern Route versus the Southern Route) were evaluated based on a qualitative analysis of their strengths and weaknesses. The evaluation considered factors including: technical; planning; land ownership; environmental; and, cost. Table 4.2 presents a summary of the qualitative analysis for the Northern Route versus the Southern Route.
- 4.3.5 Based on Table 4.2, the Northern Route is the preferred route option. Further refinement of this preferred route option has allowed for the development of the 'Preferred Option' and the 'Manorway Fleet / Northern Triangle Option'.

TAB	LE 4.2: QUALITATIVE ANALYSIS OF RO	OUTE OPTIONS

Factor	The Northern Route	The Southern Option	
Technical	The Northern Route avoids crossing the Thames Haven Branch Line (Freight Railway Line) and avoids interaction with the Sea Wall. In addition, the Northern Route has additional benefits associated with the combined use of construction equipment / infrastructure (i.e. those associated with the GEC gas pipeline – subject to detailed engineering) and also maximises the use of additional infrastructure. Therefore, the Northern Route is the preferred route option.		
Planning	Due to the short distance and similar construction methods required, the requirements for planning are likely to be similar. Therefore, there is no preferred route option.		
Land Ownership	The Northern Route's use of existing easements (i.e. those agreed: with DP World; for the associated GEC gas pipeline; and, for the existing CECL Power Station gas pipeline) has associated benefits in terms of control and access. Therefore, the Northern Route is the preferred route option.		
Environmental	Environmental impacts associated with the Northern Route and the Southern Route are similar, and are likely to be not significant. In the event that the Northern Route completely avoids the Northern Triangle (Receptor Site associated with the LG Development), there is no preferred route option.		
Cost	Due to the short distance and similar construction methods required, cost differences are likely to be not significant.		
Summary	Most Preferred	Least Preferred	

### 4.4 Description of the HV Electrical Connection

### Infrastructure for the HV Electrical Connection

- 4.4.1 The infrastructure for the HV Electrical Connection will comprise:
  - A connection to the GEC Substation, within the GEC site;
  - An underground and culverted 400 kV cable system from the GEC Substation to the National Grid Coryton South Substation; and
  - The extension of the National Grid Coryton South Substation within the existing CECL Power Station site.

### Proposed Route of the Cable System

- 4.4.2 Within the Application Site (see Figure 1), the route of the underground and culverted double circuit 400 kV cable system would:
  - Leave the GEC Substation within the GEC site, and exit the GEC site to the east, and then turn northwards following the route of the agreed easement with DP World;
  - Likely require a Horizontal Directional Drill (HDD) under the A1014 (The Manorway);
  - Turn eastwards towards the existing CECL Power Station;
  - Likely require a second HDD back under the A1014 (The Manorway); and
  - Continue south-eastwards towards the Coryton South Substation at the existing CECL Power Station.

### Options Considered

- 4.4.3 Within the Application Site, two Options are considered. These are referred to in this Environmental Report as the 'Preferred Option' and the 'Manorway Fleet / Northern Triangle Option'.
- 4.4.4 The exact route of the 400 kV cable system within the Application Site has yet to be determined. This will be determined after the appointment of the Construction Contractor / Horizontal Directional Drilling (HDD) Specialist, who will take into consideration the potential locations for the HDD drilling pits and agreements with land owners.

### Preferred Option

4.4.5 The 'Preferred Option' is shown in Figures 1A to 1D (taken from Atkins Figures 5088247/09.01/1005 to 5088247/09.01/1002), as being immediately to the north of the A1014 (The Manorway) where it is proposed to install the HV Electrical Connection under the cycle path.

### Manorway Fleet / Northern Triangle Option

- 4.4.6 The 'Manorway Fleet / Northern Triangle Option' would be employed in the event that it is not practicable to install the HV Electrical Connection under the cycle path. Under this Option it may be necessary to extend the working corridor northwards into the Manorway Fleet and the Northern Triangle (Receptor Site associated with the LG Development).
- 4.4.7 If the working corridor is to be extended northwards, access will be required into this area of open land. Accordingly, the Application Site incorporates the use of an existing access track.

### Proposed Extension of the National Grid Coryton South Substation

- 4.4.8 The equipment for the proposed extension to the National Grid Coryton South Substation will include:
  - National Grid equipment, comprising:
    - o 400 kV Rotating Centre Post (RCP) Disconnector;
    - o 400 kV Surge Arrestors; and,
    - 400 kV Air Insulated Switchgear (AIS) / Gas Insulated Switchgear (GIS) Bushings.
  - GECL equipment, comprising:
    - 400 kV GIS Circuit Breaker; and,
    - 400 kV GIS Cable Sealing Ends.
- 4.4.9 The equipment will be located between the existing National Grid Coryton South Substation equipment and the existing CECL Power Station (to the north of the Maintenance Shop / Warehouse and ACC).
- 4.4.10 However, it should be noted that there is the potential that the extension to the National Grid Coryton South Substation may result in demolition of part or all of the Maintenance Shop / Warehouse. Discussion on potential impacts is covered in Section 6 (The Likely Environmental Impacts of the HV Electrical Connection) to cover this eventuality.
- 4.4.11 The National Grid equipment will have a footprint of approximately 40 m by 17 m, and will be approximately the same height as the existing Coryton South Substation equipment.
- 4.4.12 The GECL equipment will all be housed within a GIS Building. The GIS Building will have a footprint of approximately 22 m by 17 m, and will be approximately 15 m in height. The overall compound for the GECL equipment will have a footprint of approximately 32 m by 30 m.
- 4.4.13 The proposed indicative layout and elevations of the extension of the National Grid Coryton South Substation can be seen in Figure 2.

### Permanent Operational Structures

- 4.4.14 Following construction / installation, the route of the HV Electrical Connection (i.e. the 400 kV cable system) will be permanently buried or culverted along its entire length. However, there will also be a number of permanent operational structures, including the following:
  - The extension to the existing National Grid Coryton South Substation (the proposed indicative layout and elevations can be seen in Figure 2);
  - Joint bays (or transitional bays) (which will be installed at HDD drilling sites and also at locations where joints in the 400 kV cable system would be required); and,
  - Marker posts / plates (which will be installed where the 400 kV cable system runs across or alongside a railway; runs across a road; runs across agricultural land; changes direction; and, has joint positions).

### 4.5 The Application Site

4.5.1 The Application Site for the HV Electrical Connection is shown in Figure 1.

### 5 CONSTRUCTION, OPERATION AND DECOMMISSIONING<sup>5</sup>

### 5.1 Introduction

- 5.1.1 This Section provides information on the design, construction, operation and decommissioning of the proposed HV Electrical Connection.
- 5.1.2 The majority of environmental impacts arising from the proposed HV Electrical Connection will occur during construction. Accordingly, this Section describes the standard construction / installation methods which are likely to be used in full or in part. It should be noted that these are proven construction / installation methods that have been used and developed over many years on similar projects.

### 5.2 Construction

5.2.1 During construction, the key to successful management of any potential environmental impacts lies in the implementation of a systematic approach. This should be documented in a Construction Environmental Management Plan (CEMP), which (amongst other measures) will include: measures relating to the implementation of Best Practice Construction Methods; and, measures relating to Site Specific Development Specific Method Statements.

### **Overview of Likely Construction / Installation Methods**

- 5.2.2 Insert 5.1 to Insert 5.4 show the provisional construction / installation methods for the 'Preferred Option'. These provisional construction / installation methods are discussed in this Section, and include:
  - Direct buried which results in an underground 400 kV cable system;
  - Horizontal Directional Drilling (HDD) which results in an underground 400 kV cable system; and,
  - Concrete trough which results in a culverted 400 kV cable system.
- 5.2.3 However, it should be noted that the exact route of the underground and culverted double circuit 400 kV cable system has yet to be determined (pending: the appointment of the Construction Contractor / Horizontal Directional Drilling (HDD) Specialist; the establishment of the locations of the HDD drilling pits; and, agreements with land owners.
- 5.2.4 Accordingly the information on the 400 kV cable system (and the associated provisional construction / installation methods) should be treated as indicative at this stage.

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<sup>&</sup>lt;sup>5</sup> Information in this Section has been adapted from an Atkins Document: "*Gateway Energy Centre: Construction Methods for Underground Cable and Substation Works*". (June 2012). The Atkins Document was based on the requirements set out in a National Grid Document 'TS 3.05.07 Issue 6 – Installation Requirements for Power Cables'.



### INSERT 5.1: PROPOSED INSTALLATION METHODS (SECTION A)

### **INSERT 5.2: PROPOSED INSTALLATION METHODS (SECTION B)**



The black hatched boxes indicate the likely locations for the HDD Drilling Sites (Launch / Receipt Pits).





### **INSERT 5.3: PROPOSED INSTALLATION METHODS (SECTION C)**

The black hatched boxes indicate the likely locations for the HDD Drilling Sites (Launch / Receipt Pits).

**INSERT 5.4: PROPOSED INSTALLATION METHODS (SECTION D)** 

It should be noted that there could be a requirement for a section of the 400 kV cable system to be installed by HDD near to the point where route crosses the Access Road to the Shell Tank Farm. It is recommended that prior to construction / installation a number of trial pits are dug to identify the preferred method of installation.





### **General Considerations**

- 5.2.5 Construction of an underground cable system is similar to the construction of a Gas Pipeline in terms of the requirements for manpower, construction plant and construction equipment.
- 5.2.6 All construction / installation activities will be undertaken within a temporary fenced off strip of land, which is referred to as the "working width". The ideal "working width" is typically of the order of 22 to 30 m wide. Within the "working width" the centre line of the cable is typically offset to allow for access. However, it is important to note that the "working width" can be shrunk (taking account of environmental / safety considerations) to suit the land space available. For example, for a cable system running in parallel with a road, the "working width" can be reduced in sort sections to 14 m wide.
- 5.2.7 Access points to the "working width" will be agreed in advance with the Local Planning Authority, Land Owners, Key Stakeholders and existing Utility / Service Owners. Access points to the "working width" will be carefully controlled to ensure no unauthorised public access occurs during construction.
- 5.2.8 Insert 5.5 provides typical dimensions for a "working width" for a double circuit underground 400 kV cable system. Insert 5.6 indicates the typical dimensions of an installed double circuit underground 400 kV cable system.
- 5.2.9 Normal working hours will be 07:00 to 19:00 hours Monday to Saturday. No work on any Sunday or Bank Holiday is proposed to be undertaken.
- 5.2.10 However, there may be exceptions to these working hours, such as for HDD operations, which will be agreed in advance with the Local Planning Authority.
- 5.2.11 During construction, all equipment and materials will be securely stored. Equipment will likely be stored either along the "working width" or at a Temporary Storage Compound (which would likely be located at the GEC site or at the existing CECL Power Station site). Materials will likely be stored at the Temporary Storage Compound. Security considerations will be agreed in advance with the Local Planning Authority.



# INSERT 5.5: TYPICAL DIMENSIONS FOR A "WORKING WIDTH" FOR A DOUBLE CIRCUIT 400 kV CABLE SYSTEM



INSERT 5.6: TYPICAL DIMENSIONS FOR AN INSTALLED DOUBLE CIRCUIT 400 kV CABLE SYSTEM



### Direct Buried Construction / Installation Methodology

- 5.2.12 Following establishment of the route of the 400 kV cable system and the required "working width", the normal sequence of events for the direct buried construction / installation method would likely comprise the following:
  - <u>Fencing;</u>

After surveying the route, which would comprise a walk over survey, the first activity would be to erect temporary fences along the boundaries of the "working width".

The temporary fences will allow for the secure storage of equipment along the "working width".

Hedgerow / Vegetation Removal;

Some hedgerows may need to be removed to allow continuous access along the "working width". Since hedgerows which have been removed have to be replaced, only the minimum width required for construction / installation will be removed.

Established trees would be avoided where possible.

Any hedgerows / trees which remain within the "working width" will be protected with additional fencing material where appropriate.

Insert 5.7 provides typical / indicative technical clearances and easements for an underground cable system which is to be installed in areas with high levels of vegetation. It should be noted that the dimensions in Insert 5.7 will be defined during the detailed design stage.

### INSERT 5.7: TYPICAL / INDICATIVE TECHNICAL CLEARANCES / EASEMENTS FOR AN UNDERGROUND CABLE SYSTEM WHICH IS TO BE INSTALLED IN AREAS WITH HIGH LEVELS OF VEGETATION



• Pre-construction Land Drainage Schemes;

Pre-construction land drainage schemes will be installed where necessary / appropriate to help prevent water logging of the "working width".

• <u>Top-Soil Striping / Excavation;</u>

Top-soil stripping would be undertaken within the "working width". Any top-soil stripped would be stored to one side to prevent it being mixed with the subsoil or being damaged by over-compaction.

A trench will be excavated to a depth which will allow the 400 kV cable system to be buried to the minimum depth of cover. The sub-soil from the trench excavation will be separated from the top-soil.

In areas where the top-soil is particularly shallow, the layer of top-soil and the layer of sub-soil immediately below may be stripped and stored separately.

In areas of significant environmental sensitivity / very poor soil conditions, topsoil stripping may be omitted in favour of temporary roadways. These roadways will be constructed of a geotextile material and / or hardcore which will be laid over the ground.

The top-soil stripping and excavation will be limited to the width of the trench alone.

• Cable System Installation;

For the underground 400 kV cable system installation, a short section of plastic duct will be installed in the trench. The trench will then be backfilled with graded excavation material, and the surface will be reinstated. For construction across affected roads and tracks, only one half of the carriageway would need to be closed at a time. The 400 kV cable system could either be pulled through the plastic ducts at the time or at a later date.

• Cable System Protection; and,

All laid direct buried cables and (where possible) all installed plastic ducts, will be protected from external damage by cable protection covers. The cable protection covers will either be manufactured from reinforced concrete or from a polymeric material. Where a stabilising backfill is used, the complete width of the backfilled area will be covered by cable protection covers.

The width of the cable protection covers will provide a minimum 50 mm overlap on each side of the cable (or the outside cable of any group of cables). If more than one cover is to be used across the width of the cables, the joint between covers will be laid above the space between the cables (not over the cables).

In addition, identification warning tapes will be laid 100 mm above the cable protection covers. The identification warning tapes will be a minimum of 2.5 mm thick. This is in accordance with National Grid Technical Specification 'TS 3.05.07 – Cable Installation'.

The minimum depth of cover over the cable protection covers will be (for AC System Voltages above 132 kV):

0	In Roads:	750 mm
0	Across Good Agricultural Land:	900 mm
0	Across Open Countryside:	750 mm
0	Footpaths or Grass Verges:	600 mm



Under Railways:

1400 mm

Alongside / Within 2 m of Railway: 1250 mm

The above figures stated are in accordance with the National Grid Document 'TS 3.05.07 Issue 6 – Installation Requirements for Power Cables'. The 'Under Railways' dimension has been provided by Network Rail for high speed railways. However, it should be noted that this is very much dependent on the usage.

• <u>Reinstatement</u>.

Reinstatement, including replacement of the stored top-soil and reseeding of pastureland, will be carried out within the same year as construction, unless prevented by adverse weather.

### Horizontal Directional Drilling Construction / Installation Methodology

- 5.2.13 Horizontal Directional Drilling (HDD) comprises a trenchless technique for installing underground cables along a pre-prescribed path by using a surface launched drilling rig.
- 5.2.14 HDD is normally used for long crossings (i.e. dual carriageways / wide rivers / railways) or at particularly sensitive crossings where alternative trenchless techniques prove to be unfeasible. It can also be used to drill under woodlands. HDD can be used for crossings up to lengths of 2000 m (2 km).
- 5.2.15 Detailed site investigation is essential in determining the feasibility of HDD since not all ground conditions are suitable. In addition, the detailed site investigation will establish the "working width" needed to accommodate the extra plant and equipment, and to store any additionally stripped topsoil.

Advantages of Horizontal Directional Drilling

- 5.2.16 HDD has several advantages over alternative Open Cut / Trench techniques, including:
  - Minimal impacts on the surrounding area / environment;
  - Use when trenching / excavating is not cost-effective or practical;
  - Suitability for a variety of soil conditions and jobs (including road / landscape / river crossings);
  - Prevention of traffic disruption;
  - Use for both deeper and / or longer installations compared to other techniques;
  - No requirement for an access pit;
  - Shorter completion times compared to other techniques; and
  - Directional capabilities.

### Construction / Installation Methodology

- 5.2.17 Typically, HDD methodology can be subdivided into three steps:
  - Step 1. Pilot Drilling;
  - Step 2. Reaming; and
  - Step 3. Pullback.
- 5.2.18 These three steps are described in Insert 5.8.



### INSERT 5.8: HORIZONTAL DIRECTIONAL DRILLING METHODOLOGY



Stage 1: Pilot Drilling

During Stage 1, Pilot Drilling is carried out along a two or three dimensional bended target drill line between an entry point (at the launch pit) and an exit point (at the reception pit).

The upcoming soil is loosened by the drill head located at the front end of the drill string. The drill head needed depends on soil type: a jet bit should be used for mainly hydraulic work; or, a rock bit (with a mud motor) should be used for combined hydraulic / mechanical or exclusively mechanical work.

Pilot drilling along the calculated target drill line is either controlled by an asymmetric design of the drill head or the application of a slightly angled rod element behind the drill head.



Stage 2: Reaming

During Stage 2, the size of the bore / hole from Pilot Drilling is increased up to the required diameter for the cables.

A 'reamer' (adjusted to the respective soil conditions) is attached to the drill string at the reception pit. The 'reamer' (which is non-positively connected to the drill string) is pulled and rotated through the soil back to the drilling rig at the launch pit. This extends the diameter of the bore / hole.

Each removed rod from the drilling rig at the launch pit is replaced by a new one at the reception pit, so that there is a complete drill string in the bore / hole at all times (independent of the position of the 'reamer').



Stage 3: Pullback

During Stage 3, the cables are pulled through the bore from the reception pit.

In order to compensate for failure and friction while pulling the cable, the cables are usually laid on a roller bearing and brought into the right position to access the drill canal via a top bow.

The connection between the drill string and the cable is established by a swivel joint. To retract the cables into the prepared bore, the drill string is rotated and pulled back to the drilling rig (at the launch pit). An interconnected spinning rotator prevents the transfer of the rotation of the drill string to the cables.
- 5.2.19 Following the installation of the cable, a joint bay (or transitional bay) will be installed. This will be a permanent installation.
- 5.2.20 HDD is undertaken with the aid of viscous fluid, known as the drilling fluid or the drilling mud. Drilling fluid / drilling mud is a mixture of water and (typically) bentonite which is continuously pumped to the cutting head / drill bit to facilitate the removal of cuttings.
- 5.2.21 The drilling fluid / drilling mud also assists in stabilising the bore / hole, cool the cutting head and lubricating the passage of the pipe / cable.

Access Requirements

- 5.2.22 Access tracks must be in place to provide access to the area where the HDD Project is planned (and the associated launch pits / reception pits are required). For safety and security reasons, these access tracks are often closed to the general public.
- 5.2.23 In general, access tracks are usually required to be between 3 and 4 m wide, with suitable turning / passing areas. Access tracks are usually constructed with either a track way system (which is made from high density polyethylene and can be laid straight off a lorry) or a wooden bog mat system (which require a 13 tonne excavator). Both the track way system and the wooden bog mat system are suitable for working of soft ground.

#### Space Requirements / Laydown Areas

- 5.2.24 The Space Requirements and Laydown Areas will be dependent on the HDD Project, and the associated drilling rigs which will be required.
- 5.2.25 Generally, most small drilling rigs (up to 18 tonnes) come as a self-contained unit known as a 'Beavertail'. Larger drilling rigs would need to be transported via a low-loader (40 ft / 14 m trailer).
- 5.2.26 Generally, in most cases, the launch pit requires a space of 20 m x 20 m, and the reception pit requires a space of 20 m x 10 m.
- 5.2.27 Additional land may be required to string out the cables. This is dependent upon the cable drum lengths used, and in the case of the GEC HV Electrical Connection the land required for stringing out the cables will be contained within the red line boundary shown.
- 5.2.28 If the correct requirements are in place for the access track, reinstatement will be minimal. Indeed (after the access tracks have been removed), the only areas which would require reinstatement will be the launch pit and reception pit locations.
- 5.2.29 The access routes selected for the HDD equipment and the space available within the red line boundary will provide sufficient land for access, laydown and the launch pit, reception pit, any additional HDD equipment and stringing.

#### Typical HDD Machinery Sizes / Weights

5.2.30 HDD machinery can vary significantly in both size and weight. Examples of typical sizes and weights of some available HDD machinery are provided in Table 5.1.

Model	Length (m)	Width (m)	Height (m)	Weight (tonnes)
Ditch Witch JT922	3.71	1.22	1.88	3.2
Aztec DD3238	6.15	2.26	-	8.1
Vermeer D36x50 Series	3	2.08	3	8.9
II	4.6	2.08	3	9.9
Ditch Witch JT3020	5.61	2.03	3.02	10.0
Ditch Witch JT3020 Mach 1	5.61	3.02	2.03	10.1
Ditch Witch JT4020 Mach 1	8.56	2.21	2.44	12.6
Vermeer D100x120 Series II	10.42	2.36	3	17.7
Ditch Witch JT100 Mach 1	9.35	2.79	2.57	20.5

# TABLE 5.1: SIZES / WEIGHTS OF AVAILABLE HDD DRILLING MACHINERY

5.2.31 Whilst the access track is considered sufficient to allow access for all of the above machinery, it is expected that the smaller of the machinery available could be used for the GEC HV Electrical Connection. This will be determined after the appointment of the Construction Contractor / HDD Specialist.

Use of HDD for the HV Electrical Connection

- 5.2.32 The 'Preferred Option' crosses the A1014 (The Manorway) in two locations and crosses the railway. Accordingly, under the 'Preferred Option' HDD would be used for these two crossings (i.e. as shown in Insert 5.1 to Insert 5.4).
- 5.2.33 The 'Manorway Fleet / Northern Triangle Option' crosses the A1014 (The Manorway) in two locations, the Manorway Fleet in two locations, crosses an environmentally sensitive area (the Northern Triangle<sup>6</sup>) and crosses the railway. Accordingly, under the 'Manorway Fleet / North Triangle Option' HDD would be used for these crossings.

### 5.3 Operation

- 5.3.1 Following construction / installation of the HV Electrical Connection, habitats will be reinstated.
- 5.3.2 The HV Electrical Connection will be permanently buried or culverted along its entire length, and will be designed specifically to minimise any management / maintenance requirements, and will be operated in such a manner as to keep it in good and safe condition.

#### Permanent Operational Structures

- 5.3.3 During operation, there will be a number of permanent operational structures. These include:
  - The extension to the existing National Grid Coryton South Substation;
  - Joint bays (or transitional bays); and,
  - Marker posts / plates.

<sup>&</sup>lt;sup>6</sup> It should be noted that the proposed route of the 400 kV cable system currently uses the Cycle Path on the north of the A1014 (The Manorway) and not the Northern Triangle.

- 5.3.4 The proposed indicative layout and elevations of the extension of the National Grid Coryton South Substation can be seen in Figure 2.
- 5.3.5 Joint bays (or transitional bays) will be installed at HDD drilling sites and also at locations where joints in the 400 kV cable system would be required. These are shown in Insert 5.1 to Insert 5.4. The joint bays (or transitional bays) would be permanent operational structures. Joint bays (or transitional bays) would typically:
  - Measure approximately 15 m by 5 m;
  - Be covered by a re-enforced concrete raft (approximately 150 mm thick) to allow for vehicles to cross them; and
  - Be at ground level (and not protrude above ground).
- 5.3.6 In addition, the cover for the re-enforced concrete raft would be secured (and would need to be lifted by a fork lift), and would be able to be covered (i.e. a cover of grass would be possible if the Manorway Fleet / Northern Triangle Option is employed).
- 5.3.7 Marker posts / plates will be installed where the 400 kV cable system: runs across or alongside a railway; runs across a road; runs across agricultural land; changes direction; and, has joint positions. Markers will be constructed from reinforced concrete or similar material. Whilst the dimensions of the marker posts and plates will ultimately be confirmed following detailed design, Insert 5.9 provides indicative typical dimensions of marker posts / plates. Typical dimensions of marker posts / plates are approximately 0.75 m high (750 mm high) and 0.15 m wide (150 mm wide). In addition, Insert 5.10 shows photographs of marker posts / plates.

#### **Operational Easements**

- 5.3.8 A typical operational easement for a 400 kV cable system would be in the order of 6 m. This would enable access for maintenance purposes. The operational easement requirement would approximately double at joint bay (or transitional bay) locations.
- 5.3.9 Insert 5.11 provides typical dimensions and operational easement requirements for an underground cable system which is to be installed near to existing structures / underground utilities and services.



# **INSERT 5.9: INDICATIVE TYPICAL DIMENSIONS OF MARKER POSTS / PLATES**

Where additional information is needed to be displayed on a marker post, a supplementary plate will be bolted to the marker. Indicative typical plates are shown below.











#### **INSERT 5.11: TYPICAL DIMENSIONS AND OPERATIONAL EASEMENT REQUIREMENTS**

Notes:

- 1. The cable system can be installed within 3 m of a Gas Pipeline. However, an extensive exercise will be required with National Grid Transco to ensure safe working. There may also be a requirement for additional protection of the Gas Pipeline.
- 2. The minimum distance with a cable system can cross under / over a Gas Pipeline is 600 mm as per National Grid Transo TSP SSW 22 Specification.
- 3. The minimum clearance to a second circuit (i.e. for a double circuit cable system) is 1 m.
- 4. The minimum separation distance for the 400 kV cable system to run in parallel with the Gas Pipeline will be very much dependent on the Induced Voltage Study. This is still to be undertaken.

- 5.3.10 Based on Insert 5.11, it is possible to state that:
  - The minimum distance from any above ground substantial infrastructure (e.g. fuel tanks) will be 10m; and,
  - The distance between the underground cable system and the gas pipeline may be reduced from 30 m to 3 m using a design method where all risks are identified and mitigation methods are put into place.
- 5.3.11 In addition, National Grid National Electricity Transmission will be informed of the design and location of the route of the 400 kV cable system where it is located near to their assets. The location of the proposed route of the 400 kV cable system near to the existing transmission tower (south of the A1014 (The Manorway), towards the east of the proposed route) will not interfere with the foundations for the transmission tower.

# 5.4 Decommissioning

- 5.4.1 At the end of its useful life, the HV Electrical Connection will be decommissioned.
- 5.4.2 During decommissioning (as for construction), the key to successful management of any potential environmental impacts lies in the implementation of a systematic approach. This should be documented in a Decommissioning Environmental Management Plan (DEMP), which (amongst other measures) will include: measures relating to the implementation of Best Practice Decommissioning Methods; and, measures relating to Site Specific Development Specific Method Statements.

# 6 THE LIKELY ENVIRONMENTAL IMPACTS OF THE HV ELECTRICAL CONNECTION

6.1.1 Based on the information provided in Section 4 (The HV Electrical Connection) and Section 5 (Construction, Operation and Decommissioning), the following Section provides a brief description of the likely environmental impacts of the HV Electrical Connection.

### **Options Considered**

- 6.1.2 The exact route of the 400 kV cable system within the Application Site has yet to be determined. This will be determined after the appointment of the Construction Contractor / Horizontal Directional Drilling (HDD) Specialist, who will take into consideration the potential locations for the HDD drilling pits and agreements with land owners.
- 6.1.3 As such, within the Application Site, two Options are considered. These are referred to in this Environmental Report as the 'Preferred Option' and the 'Manorway Fleet / Northern Triangle Option'

### Preferred Option

- 6.1.4 The 'Preferred Option' is shown in Figures 1A to 1D (taken from Atkins Figures 5088247/09.01/1005 to 5088247/09.01/1002), as being immediately to the north of the A1014 (The Manorway) where it is proposed to install the HV Electrical Connection under the cycle path.
- 6.1.5 Under the 'Preferred Option' the following assumptions were made:
  - Construction methods will be as indicated in Insert 5.1 to Insert 5.4 (i.e. the use of HDD would be in line with Paragraph 5.2.32); and,
  - The cycle path would be fully re-instated post-construction.

Manorway Fleet / Northern Triangle Option

- 6.1.6 The 'Manorway Fleet / Northern Triangle Option' would be employed in the event that it is not practicable to install the HV Electrical Connection under the cycle path. Under this Option it may be necessary to extend the working corridor northwards into the Manorway Fleet and the Northern Triangle (Receptor Site associated with the LG Development).
- 6.1.7 Under the 'Manorway Fleet / Northern Triangle Option' the following assumptions were made:
  - Alterations to the construction methods as indicated in Insert 5.1 to Insert 5.4 such that the Manorway Fleet / Northern Triangle is crossed via HDD (i.e. the use of HDD would be in line with Paragraph 5.2.33);
  - The existing access track would be used for access to the north of the Manorway Fleet (and no significant alteration to this access track is proposed);
  - No vegetation clearance is proposed;
  - No hedges are proposed to be removed;
  - Water bodies / ditches / drains are to be avoided or existing crossing points over water bodies / ditches / drains are to be used;
  - Additional agreements would be needed with Natural England / Environment Agency / DP World for construction works within the Manorway Fleet / Northern Triangle based on the agreed locations of the HDD drilling pits and any associated works; and

• Construction Specific Method Statements would be developed and agreed with the Relevant Authorities.

# Likely Environmental Impacts

- 6.1.8 Table 6.1 presents the likely impacts of construction of the HV Electrical Connection. The likely impacts of decommissioning of the HV Electrical Connection are expected to be similar, and of an equal or lower significance.
- 6.1.9 Table 6.2 presents the likely impacts of operation of the HV Electrical Connection.

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Landscape and Visual	Noise and Vibration fr	Air Quality s o ti ti ti ti	Impact Type
or both the Preferred Option and ne Manorway Fleet / Northern riangle Option: Landscape impacts may arise on Local Landscape Character due to construction. Visual impacts will arise from the presence of cranes, machinery, excavations and temporary structures, etc.	or both the Preferred Option and ne Manorway Fleet / Northern riangle Option, there is the potential or noise impacts due to the nature f construction work (the use of oise generating plant) and the dditional traffic generated at this me.	or both the Preferred Option and ne Manorway Fleet / Northern riangle Option, there is the potential or impacts on air quality due to the ature of construction work (dust missions arising from activities uch as excavating / earth moving perations / demolition of faintenance Shop) and the dditional traffic generated at this me.	onstruction Impacts
Construction works will be screened by hoarding, where practical, to mitigate landscape and visual impacts near to sensitive receptors.	Construction plant and activities will be managed and controlled through a CEMP.	Dust emissions will be managed and controlled through a Construction Environmental Management Plan (CEMP).	Mitigation
Although mitigation measures will reduce landscape and visual impacts, it is likely that minor, temporary landscape and visual impacts will arise during the construction phase. As these impacts will be temporary in nature, the residual impact is assessed as not significant.	Although all construction works will be undertaken in accordance with a CEMP, it is still likely that there may be minor, temporary local noise impacts at receptors located between 100 m and 300 m from the electrical connection route. As these impacts will be temporary in nature, the residual impact is assessed as not significant.	The residual impact is assessed as not significant.	Residual Effects
CEMP.	CEMP.	CEMP.	Means by which Mitigation will be Delivered

 $^7$  The likely impacts of decommissioning of the HV Electrical Connection are expected to be similar.

	fects by which Mitigation will b Delivered	ction, any habitat which d will be re-instated. e residual impact is not significant.	impact is assessed as CEMP.	impact is assessed as CEMP.
	Residual Eft	Post-constru- was removed Therefore the assessed as	The residual not significar	The residual not significar
	Mitigation	Habitat surveys and protected species surveys will be undertaken prior to construction works commencing on site. Areas where protected species are known to occur or areas with the potential to support ecological habitat will be avoided where possible, and removal of habitat will not occur during the breeding season.	This impact will be managed and controlled through a CEMP and drainage strategy. Any water crossings will be designed to reduce impacts on water bodies. No untreated water will be allowed to drain to controlled waters.	This impact will be managed and controlled through a CEMP. Procedures will be put in place to deal with any pollution spills. Where hot spots are encountered, these will be remediated as necessary, in the appropriate manner.
RHOFF	Construction Impacts	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, there is the potential for impacts on ecology to arise. Further information is provided in Section 8 (Ecological Impact Assessment).	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, there is the potential for impacts on controlled waters to arise due to: increased sedimentation from open-cut crossings of streams and rivers (if required); surface water run-off to the local watercourses; permeation of pollutants to local aquifers; and, drainage to local watercourses or land for natural soak away. Further information is provided in Section 9 (Water Resources Assessment).	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, contaminants (such as fuels and concrete) will be used. There is the potential for land contamination to occur as a result of spillages. Furthermore, unidentified 'hot spots' of pollution could be encountered.
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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Land Use	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, there may be temporary loss of land.	The land used temporarily for laydown / occupation will be subject to protection measures during the construction works, and re-instated after. Productive land required will be minimised during electrical connection route selection.	All land will be re-instated post construction. Therefore the residual impact is assessed as not significant.	CEMP.
Traffic	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, there may be additional construction traffic in the form of HGVs and construction personnel vehicles.	Traffic will be managed and controlled through a CTMP.	Construction traffic associated with the HV Electrical Connection will be less concentrated, as it will not be necessary for all vehicles accessing the working width to do so via one site entrance. Due to the low level of construction traffic generation and existing traffic on these roads, the residual impact is assessed as not significant.	CEMP / CTMP.

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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Cultural Heritage	The cultural heritage in the area is well undertaken for GEC, the undertaken for GEC, the underground gas pipeline and associated AGI, and the LG Development. As such, the existence and whereabouts of any existing cultural heritage features which have the potential to be impacted upon are already well understood. These will be avoided. For both the Preferred Option and the Manorway Fleet / Northern Triangle Option: • There is a potential for the setting of cultural heritage features (i.e. Listed Buildings) to be subject to landscape and visual impacts. • In addition, there is a potential for unknown cultural heritage features to be impacted upon.	<ul> <li>A range of mitigation measures can be implemented. These include:</li> <li>Those described for landscape and visual impacts (i.e. construction works will be screened by hoarding, where practical) to mitigate landscape and visual impacts near to sensitive receptors;</li> <li>Using a targeted Archaeological Watching Brief; and,</li> <li>Using soil stripping as an early construction activity to allow sufficient time for any investigation and recording to take place.</li> </ul>	In terms of landscape and visual impacts to cultural heritage features, although mitigation measures will reduce impacts, it is likely that minor, temporary impacts will arise during the construction phase. As any impacts will be temporary in nature, the residual impact is assessed as not significant. In terms of unknown cultural heritage features, based on the work undertaken for GEC, the undertaken for GEC, the undertaken AGI, and the LG Development, there is low potential for known and unknown cultural heritage features to be impacted upon. The residual impact is assessed as not significant.	CEMP.
Socio-Economics	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, there are short term employment opportunities.	The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	Positive impact, albeit short term. The residual impact is assessed as not significant.	None Required.

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Health	Safety	Impact Type
For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, during construction, there may be the potential for impacts on health due to air / dust emissions, noise and transport.	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, there are a number of safety considerations which need to be implemented such that the electrical connection can be designed, built and tested (i.e. constructed) in such a way that its integrity is not comprised during its operational lifetime.	Construction Impacts
The aspects of the environment most likely to cause impacts on health (air / dust emissions, noise and transport) will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a Health Management Plan (HMP).	The electrical connection will be designed and constructed in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.	Mitigation
The residual impact is assessed as not significant.	The residual impact is assessed as not significant.	Residual Effects
CEMP (for other aspects of the environment listed above) / HMP.	Compliance with relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.	Means by which Mitigation will be Delivered

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TABLE 6.2: LIKELY IMPACTS OF OPERATION OF THE HV ELECTRICAL CONNECTION

Impact Type	Operation Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Air Quality	No impacts identified.	N / A	N/A	N / A
Noise and Vibration	No impacts identified.	N / A	N / A	N / A
Landscape and Visual	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, during operation, the only visible features of the development will be the extension to the existing Coryton South Substation at the CECL Power Station, the joint bays (or transitional bays) and the marker posts / plates.	The existing Coryton South Substation will likely be screened by the existing development in the area. The joint bays (or transitional bays) and marker posts / plates will be low lying and will likely not be visible.	Therefore the residual impact is assessed as not significant.	N / A
Ecology	No impacts identified.	N/A	N / A	N / A
Water Quality	No impacts identified.	N / A	N / A	N / A
Geology and Land Contamination	No impacts identified.	N/A	N / A	N / A
Land Use	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, permanent occupation of land by extension of existing Coryton South Substation at the CECL Power Station.	The landowner will be compensated by financial means for the permanent occupation of land.	The residual impact is assessed as not significant.	Legal agreement with the relevant landowners.
Traffic	No material impacts identified.	N/A	N / A	N / A
Cultural Heritage	No impacts identified.	N/A	N / A	N / A
Socio-Economics	No impacts identified.	N/A	N / A	N / A

Impact Type	Operation Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Safety	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, there are a number of safety considerations which need to be implemented such that electrical connection can be operated in such a way that its integrity is not comprised.	The electrical connection will be operated in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.	The residual impact is assessed as not significant.	Compliance with relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.
Health	For both the Preferred Option and the Manorway Fleet / Northern Triangle Option, during operation, there may be the potential for impacts on health.	The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a HMP.	The residual impact is assessed as not significant.	CEMP (for other aspects of the environment listed above) / HMP.

### 7 FRAMEWORK FOR A CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

# 7.1 Introduction

- 7.1.1 This Section outlines a 'Framework for a Construction Environmental Management Plan' for the HV Electrical Connection. The primary aim is of the Framework is to anticipate where compliance would be required with safeguards identified during the high level assessment process, and also where compliance would be required by any conditions which are likely to be written into the Planning Permission.
- 7.1.2 The Framework will be used by the Construction Contractor in the development of their Construction Environmental Management Plan (CEMP). The CEMP will be approved by the Local Planning Authority.

### 7.2 Environmental Management

- 7.2.1 Effective environmental management is an important consideration throughout the development of the HV Electrical Connection, from design through to construction through to operation.
- 7.2.2 The key elements of effective environmental management include:
  - A process of iterative route design to minimise any potential environmental impacts identified in the high level environmental assessment process;
  - Selection of appropriate construction methodologies which are designed to minimise any potential environmental impacts identified in the high level environmental assessment process;
  - Putting in place procedures for the selection, management and auditing of the Construction Contractor, including a requirement for the Construction Constructor to produce a CEMP (which is in line with this Framework for Environmental Management); and,
  - The production of a 'Project Specific' Overall Environmental Management Plan for the construction / operation activities.

### 7.3 Summary of Likely Environmental Impacts and Proposed Mitigation

- 7.3.1 The high level assessment process for HV Electrical Connection has included a determination of how the potential likely significant environmental impacts will be avoided or reduced through design, mitigation and monitoring.
- 7.3.2 Therefore, following identification of potential likely significant environmental impacts it is likely that the following steps will be taken:
  - Development of appropriate mitigation / monitoring measures;
  - Establishment of criteria for crossing sensitive sites (if required);
  - Effective management and control of the construction activities;
  - Post-construction reinstatement;
  - Post-construction auditing; and,
  - Effective management and control of the operational activities.
- 7.3.3 In terms of the first step, in the hierarchy of mitigation, likely significant adverse impacts should in the first instance be avoided altogether, then reduced and finally offset.
- 7.3.4 Significant adverse impacts are best avoided through design.

- 7.3.5 Where it is not possible to avoid significant adverse impacts, monitoring measures / plans will be prepared to help reduce / offset for the impact identified.
- 7.3.6 Table 7.1 briefly summarises the information provided in Section 6 (The Likely Environmental Impacts of the HV Electrical Connection).

# TABLE 7.1: LIKELY IMPACTS OF CONSTRUCTION / OPERATION OF THE HV ELECTRICAL CONNECTION AND SUMMARY OF PROPOSED MITIGATION

Aspect	Description of Likely Potential Impact	Design / Mitigation / Monitoring Measures
Air Quality	During construction (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option), there is the potential for impacts on air quality due to the nature of construction work (dust emissions arising from activities such as excavating / earth moving operations) and the additional traffic generated at this time.	Dust emissions will be managed and controlled through a CEMP. The residual impact is assessed as not significant.
	During operation, no impacts have been identified.	N / A
Noise and Vibration	During construction, (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option), there is the potential for noise impacts due to the nature of construction work (the use of noise generating plant) and the additional traffic generated at this time.	Construction plant and activities will be managed and controlled through a CEMP. Although all construction works will be undertaken in accordance with a CEMP, it is still likely that there may be minor, temporary local noise impacts at receptors located between 100 m and 300 m from the electrical connection route. As these impacts will be temporary in nature, the residual impact is assessed as not significant.
	During operation, no impacts have been identified.	N / A
ual	<ul> <li>During construction (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option):</li> <li>Landscape impacts may arise on Local Landscape Character.</li> </ul>	Construction works will be screened by hoarding, where practical, to mitigate landscape and visual impacts near to sensitive receptors. Although mitigation measures will reduce landscape and visual impacts, it is likely that minor, temporary landscape and visual impacts
ie and Visu	<ul> <li>Visual impacts will arise from the presence of cranes, machinery, excavations and temporary structures, etc.</li> </ul>	will arise during the construction phase. As these impacts will be temporary in nature, the residual impact is assessed as not significant.
Landscap	During operation, (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option), the only visible features of the development will be the extension to the existing Coryton South Substation at the CECL Power Station, the joint bays (or transitional bays) and the marker posts / plates.	The existing Coryton South Substation will likely be screened by the existing development in the area. The joint bays (or transitional bays) and marker posts / plates will be low lying and will likely not be visible. Therefore the residual impact is assessed as not significant.

Aspect	Description of Potential Impact	Design / Mitigation / Monitoring Measures
	During construction (for both the Proferred	Habitat surveys and protected species surveys will be undertaken prior to construction works commencing on site.
ology	Option and the Manorway Fleet / Northern Triangle Option), there is the potential for impacts on ecology to arise.	occur or areas with the potential to support ecological habitat will be avoided where possible, and removal of habitat will not occur during the breeding season.
Ec	(Ecological Impact Assessment).	Post-construction, any habitat which was removed will be re-instated.
		Therefore the residual impact is assessed as not significant.
	During operation, no impacts have been identified.	N / A
Water Quality	During construction, (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option), there is the potential for impacts on controlled waters to arise due to: increased sedimentation from open-cut crossings of streams and rivers (if required); surface water run-off to the local watercourses; permeation of pollutants to local aquifers; and, drainage to local watercourses or land for natural soak away.	This impact will be managed and controlled through a CEMP and drainage strategy. Any water crossings will be designed to reduce impacts on water bodies. No untreated water will be allowed to drain to controlled waters. The residual impact is assessed as not significant.
	During operation, no impacts have been identified.	N / A
ıd Land ıation	<ul> <li>During construction (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option):</li> <li>Contaminants (such as fuels and concrete) will be used. There is the potential for land</li> </ul>	This impact will be managed and controlled through a CEMP. Procedures will be put in place to deal with any pollution spills. Where hot spots are encountered, these will be
ogy ar ntamii	contamination to occur as a result of spillages.	remediated as necessary, in the appropriate manner.
Geol Co	Onligentified 'not spots' of pollution could be encountered.	I ne residual impact is assessed as not significant.
	During operation, no impacts have been identified.	N / A

Aspect	Description of Potential Impact	Design / Mitigation / Monitoring Measures
and Use	During construction, (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option), there may be temporary loss of land.	The land used temporarily for laydown / occupation will be subject to protection measures during the construction works, and re-instated after. Productive land required will be minimised during electrical connection route selection. All land will be re-instated post construction. Therefore the residual impact is assessed as not significant.
	During operation, (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option), there will be a permanent occupation of land by the extension of existing Coryton South Substation at the CECL Power Station.	The landowner will be compensated by financial means for the permanent occupation of land. Therefore, the residual impact is assessed as not significant.
Traffic and Infrastructure	During construction, (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option), there may be additional construction traffic in the form of HGVs and construction personnel vehicles.	Traffic will be managed and controlled through a CTMP. Construction traffic associated with the HV Electrical Connection will be less concentrated, as it will not be necessary for all vehicles accessing the working width to do so via one site entrance. Due to the low level of construction traffic generation and existing traffic on these roads, the residual impact is assessed as not significant.
Cultural Heritage	<ul> <li>identified.</li> <li>The cultural heritage in the area is well understood from the work undertaken for GEC, the underground gas pipeline and associated AGI, and the LG Development.</li> <li>As such, the existence and whereabouts of any existing cultural heritage features which have the potential to be impacted upon are already well understood. These will be avoided.</li> <li>However, during construction (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option):</li> <li>There is a potential for the setting of cultural heritage features (i.e. Listed Buildings) to be subject to landscape and visual impacts; and,</li> <li>There is a potential for unknown cultural heritage features to be impacted upon.</li> </ul>	<ul> <li>A range of mitigation measures can be implemented. These include:</li> <li>Using a targeted Archaeological Watching Brief; and,</li> <li>Using soil stripping as an early construction activity to allow sufficient time for any investigation and recording to take place.</li> <li>Based on the work undertaken for GEC, the underground gas pipeline and associated AGI, and the LG Development, there is low potential for known and unknown cultural heritage features to be impacted upon.</li> <li>The residual impact is assessed as not significant.</li> </ul>

Aspect	Description of Potential Impact	Design / Mitigation / Monitoring Measures
o-Economics	During construction, (for both the Preferred Option and the Manorway Fleet / Northern Triangle Option), there are short term employment opportunities.	The socio-economic impacts are deemed to be positive, therefore no mitigation is required. Positive impact, albeit short term. The residual impact is assessed as not significant.
Soci	During operation, no impacts have been identified.	N/A

- 7.4 Suggested Contents of Construction Environmental Management Plan
- 7.4.1 During construction, the key to the successful management of any potential environmental impacts lies in the implementation of a systematic approach. This will be documented in a CEMP.
- 7.4.2 The CEMP will include:
  - Measures relating to the implementation of Best Practice Construction Methods (such as lighting schemes and timings of works);
  - Measures relating to Site Specific / Development Specific Method Statements;
  - Measures relating to site safety issues;
  - A Construction Transport Management Plan (CTMP);
  - Measures relating to the control of pollution, including:
    - Procedures that follow the Pollution Prevention Guideline provided by the Environment Agency to prevent pollution of water courses by silt or chemicals;
    - Procedures for the implementation of good construction site management to avoid / minimise generation of excessive litter, dust, noise and vibration;
    - o Procedures to avoid / minimise potential for fuel and chemical spills; and,
    - A Pollution Incident Response Plan.
  - Measures relating to the control of waste;
  - Measures relating to the protection of ecology, including:
    - The requirement that briefings and instruction to be given to Contractors regarding the biodiversity issues associated with the site;
    - The requirement that work compounds and access tracks are not located in, or adjacent to, areas that maintain habitat value or are within areas supporting protected species; and,
    - The establishment of site fencing to prevent access to areas outside the working width, particularly in areas adjacent to features of ecological interest or value;
    - Environmental Awareness Training Plans;
    - Specific Ecological / Species Plans.
  - A Contingency and Emergency Response Plan;
  - A Reinstatement and Aftercare Plan;
  - A Liaison Plan; and,
  - Audit Schedule and Procedures.
- 7.4.3 The Construction Contractor will be required to produce and implement the CEMP, and should identify site responsibilities for environmental management and describe how the various environmental management activities will be undertaken.
- 7.4.4 In preparing the CEMP, the Construction Contractor will need to give appropriate thought to the requirements for: consultations; consent / licence / permit applications; communication and training on environmental awareness; selection and management of sub-contractors; and, environmental monitoring and auditing.



#### Communication and Training on Environmental Awareness

- 7.4.5 Site briefings should be given to all staff through induction talks before the start of construction, and through further Health, Safety and Environmental talks setting out the key procedures during construction.
- 7.4.6 This would ensure that site personnel are fully aware of the key environmental management procedures which have been set in place to mitigate any potential environmental impacts.

#### Environmental Monitoring and Auditing

- 7.4.7 The Construction Contractor will be required to carry out regular site inspections and monthly audits during the construction phase to ensure that works comply with statutory and contract requirements.
- 7.4.8 Table 7.2 details the likely environmental monitoring and auditing processes which would be implemented.
- 7.4.9 At the end of the construction phase, a Site Inspection and Audit will also be required to demonstrate that all reinstatement complies with the agreed obligations (for example: the replanting of hedgerows; reinstatement of the working width; and, reinstatement of land drainage schemes).
- 7.4.10 In addition, GECL will undertake Site Inspections and Audits before and during construction to verify the Construction Contractor's environmental performance.



# TABLE 7.2: ENVIRONMENTAL MONITORING AND AUDITING PROCESSES

Responsible Party	Parameter to be Measured	Monitoring Process	Acceptance Criteria / Auditing Process
	Environmental Training	Records to be maintained of personnel induction training and talks.	In accordance with Health, Safety and Environment Specification.
	Access to Site (once	Hauliers to comply with the agreed CTMP.	To be included in Health,
	agreed)	Compliance and speed restrictions to be checked regularly.	Safety and Environment Report.
	Liaison with Local Council	Regular construction update to be provided.	Regular report.
	Liaison with Other Contractors	Regular meeting.	Minutes of meetings.
	Noise Impact	Notify Local Council when work outside of agreed hours is to be undertaken.	Regular report.
	Ecological Impact		Written inspection report.
Principal Construction	Waste Storage and Disposal Facilities at	Regular inspections of working areas and waste storage areas.	To be included in Health, Safety and Environment
Contractor	Construction Compound	Regular inspection of vehicles and fuel storage areas for fuel leaks.	Report.
	Fuel / Chemical Spille	Reporting of all accidental spillages in accordance with HSE Specification.	To be included in Health,
		Regular inspection of vehicles and fuel storage areas for fuel leaks.	Report.
	Archaeological Impact	Archaeological watching brief during topsoil stripping and trenching	Written inspection report.
	Reinstatement of working width	Reinstatement monitoring after construction contractor's liability ends.	In accordance with the findings and recommendations of the Environmental Report (i.e. see Section 5 (Construction, Operation and Decommissioning) and Section 8 (Ecological Impact Assessment)).

# 8 ECOLOGICAL IMPACT ASSESSMENT

#### 8.1 Introduction

- 8.1.1 This Section presents the results of the Ecological Impact Assessment (EcIA).
- 8.1.2 This Section has been prepared to support and confirm the results of the Screening Process presented in Section 2 (The Purpose and Scope of the Environmental Report).
- 8.1.3 Accordingly, this Section assesses the significance of the environmental impacts associated with the development of the HV Electrical Connection on the existing ecological receptors within the Ecological Survey Area.
- 8.1.4 In particular this Section considers:
  - 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) which could be affected by the Project; and,
  - 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) which could be affected by the Project.
- 8.1.5 This Section is supported by an initial Phase 1 Habitat Survey and Phase 2 Protected Species Surveys. These Reports are presented in the supporting Ecological Surveys Volume. Information pertaining to Badgers is provided in a Confidential Ecological Survey Volume.

#### 8.2 Legislative and Policy Framework

- 8.2.1 Legislation relating to wildlife, ecology and countryside, planning policy and guidance and references to both Local and National Biodiversity Action Plans (including their context and applicability) are explained as appropriate in the relevant Reports presented in the supporting Ecological Surveys Volume. In particular, a summary of legislation and guidance for protected and notable species and habitats in the UK is presented at the end of the Phase 1 Habitat Survey Report.
- 8.2.2 The key legislation and policy of relevance (and in turn those which have informed the inclusion and exclusion of species and habitats within this assessment) are:
  - The Bonn Convention 1979;
  - The Bern Convention 1982;
  - The Convention on Biological Diversity 1993;
  - The Habitats Directive (EU Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora);
  - The Birds Directive (EU Directive 2009/147/EC on the conservation of wild birds);
  - The Conservation of Habitats and Species Regulations 2010 (Habitats Regulations) (as amended);
  - The Wildlife and Countryside Act 1981 (as amended) (WCA);
  - The Countryside and Rights of Way Act 2000 (CRoW);
  - The Natural Environment and Rural Communities Act 2006 (NERC);
  - The Protection of Badgers Act 1992;
  - National Planning Policy Framework 2012;

- The UK Biodiversity Action Plan (UKBAP);
- The Local Biodiversity Action Plan (LBAP) for Essex and Thurrock;
- The East of England Plan;
- Thurrock Borough Core Strategy; and,
- Thurrock Borough Local Plan.
- 8.2.3 Specific planning policies applicable to the EcIA are presented (and assessed) in the supporting Planning Statement.

# 8.3 Assessment Methodology

- 8.3.1 The assessment methodology used within this Section for the EcIA is based on Guidance issued by the Institute of Ecology and Environmental Management (IEEM)<sup>8</sup>.
- 8.3.2 The assessment methodology involves the following key stages:
  - Consultation;
  - Establishment of the Baseline;
  - Identification of Valued Ecological Receptors;
  - Identification and Characterisation of Potential Impacts; and,
  - Assessment of Significance.
- 8.3.3 These stages are explained further below.

# Consultation

- 8.3.4 Several statutory and non-statutory Consultees were consulted to inform this assessment. These included:
  - Natural England;
  - Essex Bat Group;
  - Essex Small Mammal and Bat County Recorder;
  - Essex Freshwater Invertebrate County Recorder\*;
  - Essex Terrestrial Invertebrate County Recorder\*;
  - Essex Bird County Recorder\*;
  - Essex Wildlife Trust;
  - Essex Badger Protection Group; and,
  - Essex Flora County Recorder\*.

\* No data was available for the search area or was not provided.

- 8.3.5 The following web-based databases also were consulted:
  - National Biodiversity Network (NBN) Gateway Accessed 26 April 2012;
  - Multi Agency Geographic Information for the Countryside (MAGIC) Accessed 26 April 2012; and,
  - Nature on the Map Accessed 26 April 2012.

<sup>&</sup>lt;sup>8</sup> IEEM (2006) Guidelines for Ecological Impact Assessment in the UK (IEEM).

- 8.3.6 Further information is provided within Section 2 of the Phase 1 Habitat Survey Report in the Ecological Surveys Volume.
- 8.3.7 The responses received have been incorporated within the following stages of the EcIA.

Establishment of the Baseline / Coverage of the Application Area

Desk Studies

- 8.3.8 Due to the existence of a number of recent Ecological Studies and Reports produced to inform the Consent applications for GEC, the GEC Underground Gas Pipeline and Associated AGI and the LG Development, no new data search was considered necessary.
- 8.3.9 Instead a review of the existing data was undertaken. In the first instance, data from the GEC Underground Gas Pipeline and Associated AGI Ecological Scoping Report (2010 Ecological Scoping Report) was reviewed.
- 8.3.10 This data is less than three years old and is directly relevant to the proposed route of the HV Electrical Connection. Therefore, it is considered to be accurate and still relevant.
- 8.3.11 The 2010 Ecological Scoping Report included a thorough and detailed Desk Study of a "Search Area" within 1 km of the proposed route of the Underground Gas Pipeline and Associated AGI.
- 8.3.12 In line with this, for this Ecological Assessment, a "Search Area" comprising a width of up to 1 km from the proposed route of the HV Electrical Connection Route is used for all Statutory and Non-Statutory Designated Sites. These included:
  - Special Areas of Conservation (SAC);
  - Special Protection Areas (SPA);
  - Ramsar Sites;
  - Sites of Special Scientific Interest (SSSI);
  - National Nature Reserves (NNR);
  - Local Nature Reserves (LNR);
  - Sites of Importance for Nature Conservation (SINC); and,
  - Local Wildlife Sites (LWS).
- 8.3.13 A further "Search Area" comprising a width of up to 2 km from the proposed route of the HV Electrical Connection Route was used for all Protected and Notable Species / Habitats.
- 8.3.14 In addition to the above, the Phase 2 Protected Species Reports produced for the GEC Underground Gas Pipeline and Associated AGI (and the initial, now superseded, Grid Connection Route) were reviewed. These Phase 2 Protected Species Reports included the following:
  - Phase 2 Bat Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010);
  - Phase 2 Breeding Bird Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010);
  - Phase 2 Great Crested Newt Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010);

- Phase 2 Reptile Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010);
- Phase 2 Water Vole Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010); and,
- Phase 2 Bat Report: Grid Connection Electricity Cabling Routes (PB, 2011).
- 8.3.15 These Phase 2 Reports contained (where relevant) reference to other Reports / Surveys / Data which have been undertaken in the area (i.e. those undertaken and being undertaken for the LG Development).

**Ecological Baseline Surveys** 

- 8.3.16 A range of ecological baseline surveys have been carried out during 2012. Each of these baseline surveys was intended to help inform the Surveys Area's value for flora and fauna.
- 8.3.17 An initial Phase 1 Habitat Survey confirmed which habitats types are present and thus which Protected and Notable Species are likely to be present. Accordingly, and subsequent to the Phase 1 Habitat Survey, Phase 2 Protected Species Surveys were carried out for:
  - Badgers;
  - Water Voles;
  - Reptiles;
  - Great Crested Newts (GCN); and,
  - Terrestrial Invertebrates.
- 8.3.18 These Phase 2 Protected Species Surveys confirmed the presence / absence and / or population abundance of the species groups.
- 8.3.19 The Phase 2 Survey Reports for each of these species / species groups (excluding Badgers) are presented in the Ecological Surveys Volume. Information pertaining to Badgers is provided in a Confidential Ecological Survey Volume.

### Desk Study / Ecological Survey Coverage

- 8.3.20 Taken together, the information from the Desk Study and the further Ecological Surveys is considered sufficient to assess the area contained within the Application Site.
- 8.3.21 This consideration is made in line with the previous assessments undertaken for GEC and the Underground Gas Pipeline and Associated AGI, and is in line with the consultation undertaken with Natural England specifically for the HV Electrical Connection.
- 8.3.22 Furthermore, with regards to Ecological Survey Coverage, Table 8.1 provides details of the Survey Reports which have been used to inform this assessment.

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Year	Report Title	Reports Referenced
		GEC Underground Gas Pipeline and Associated AGI Ecological Scoping Report (PB, 2010).
		Phase 2 Bat Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010).
		Phase 2 Bat Report: Grid Connection Electricity Cabling Routes (PB, 2011).
2012	Extended Phase 1 Habitat Survey: Gateway Energy Centre Grid Connection	Phase 2 Breeding Bird Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010).
		Phase 2 Great Crested Newt Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010).
		Phase 2 Reptile Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010).
		Phase 2 Water Vole Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010).
2012	Badger Phase 2 Survey Report: Gateway Energy Centre Grid	Extended Phase 1 Habitat Survey: Gateway Energy Centre Grid Connection (2012).
2012	Connection (Strictly Confidential)	GEC Underground Gas Pipeline and Associated AGI Ecological Scoping Report (PB, 2010).
		Extended Phase 1 Habitat Survey: Gateway Energy Centre Grid Connection (2012).
2012	Great Crested Newt Phase 2 Survey Report: Gateway Energy Centre Grid Connection	Phase 2 Great Crested Newt Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010).
		Thomson Ecology (2010) Great Crested Newt Trapping Report 2010 for DP World London Gateway Port Ltd.
2012	Thames Haven 400 kV Invertebrate Survey Report	Extended Phase 1 Habitat Survey: Gateway Energy Centre Grid Connection (2012).

# TABLE 8.1: SUMMARY TABLE OF ECOLOGICAL SURVEY REPORTS USED WITHIN THIS ASSESSMENT

2012

Reptile Phase 2 Survey Report: Gateway Energy Centre Grid Connection

Extended Phase 1 Habitat Survey: Gateway Energy Centre Grid Connection (2012).

Phase 2 Reptile Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010).

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Year	Report Title	Reports Referenced
C FOC	Water Vole Phase 2 Survey Report: Gateway Energy Centre Grid	Extended Phase 1 Habitat Survey: Gateway Energy Centre Grid Connection (2012).
2012	Connection	Phase 2 Water Vole Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes (PB, 2010).

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2010	Year
GEC Underground Gas Pipeline and Associated AGI Ecological Scoping Report	Report Title
<ul> <li>ENVIRON (2009). Wintering Bird Survey: Gateway Energy Centre Proposed Power Station Site and Pipeline Route. InterGen.</li> <li>P&amp;O and Shell (2004). The (London Gateway Logistics and Commercial Centre) Outline Planning Application 2002. Environmental Statement, Chapter 18. London Gateway.</li> <li>Thomson Ecology (2008). Bat Activity Survey Interim Report 2<sup>nd</sup> Visit. Thomson Ecology for DP World.</li> <li>Thomson Ecology (2008). Breeding Birds Ecological Action Plan.</li> <li>Thomson Ecology (2008). Breeding Birds Ecological Action Plan.</li> <li>Thomson Ecology for DP World.</li> <li>Thomson Ecology (2008). Breeding Birds Ecological Action Plan.</li> <li>Thomson Ecology (2008). Breeding Birds Ecological Action Plan.</li> <li>Thomson Ecology (2008). Breat Crested Newt Survey 2008.</li> <li>Thomson Ecology (2008). Great Crested Newt Ecological Habitat Management and Maintenance Plan. Thomson Ecology for DP World.</li> <li>Thomson Ecology (2008). Reptile Ecological Action Plan.</li> <li>Thomson Ecology (2008). Water Vole Trapping Ecological Action Plan.</li> <li>Thomson Ecology (2008). Wintering Birds Ecological Action Plan.</li> </ul>	Reports Referenced

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Year	Report Title	Reports Referenced
		GEC Underground Gas Pipeline and Associated AGI Ecological Scoping Report (PB, 2010). Thomson Ecology (2008). Great Crested Newt Survey. Thomson Ecology for DP World.
2010	Phase 2 Great Crested Newt Report: Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes	Thomson Ecology (2008). Great Crested Newt Ecological Habitat Management and Maintenance Plan. Thomson Ecology for DP World.
		Thomson Ecology (2009). Great Crested Newt Survey for A13 / A1014 Junction, Off-site Rail Bend and Great Garlands Farm Elbow Receptor Site. Thomson Ecology for DP World.
		GEC Underground Gas Pipeline and Associated AGI Ecological Scoping Report (PB, 2010).
2010	Phase 2 Reptile Report: Gateway Energy Centre Gas Pipeline and	Parsons Brinckerhoff (2010). Phase 2 Great Crested Newt Report for the Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes.
		Thomson Ecology (2008). London Gateway – Site A Reptile Mitigation Method Statement. Thomson Ecology for DP World.
		Thomson Ecology (2008). Reptile Ecological Action Plan. Thomson Ecology for DP World.
		GEC Underground Gas Pipeline and Associated AGI Ecological Scoping Report (PB, 2010).
		Parsons Brinckerhoff (2010). Phase 2 Great Crested Newt Report for the Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes.
2010	Phase 2 Water Vole Report: Gateway Energy Centre Gas Pipeline	Parsons Brinckerhoff (2010). Phase 2 Reptile Report for the Gateway Energy Centre Gas Pipeline and Electricity Cabling Routes.
		Thomson Ecology (2009). London Gateway Development – River Colne Catchment Water Vole Survey. Thomson Ecology for DP World.
		Thomson Ecology (2008). Site A – Summary of Ecological Works. Thomson Ecology for DP World.
		Thomson Ecology (2008). Water Vole Ecological Action Plan. Thomson Ecology for DP World.

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#### Identification of Valued Ecological Receptors

- 8.3.23 It is impractical and inappropriate for an assessment of the ecological effects of a proposed development to consider every species and habitat that may be affected.
- 8.3.24 Instead, this assessment methodology focuses on 'Valued Ecological Receptors' (VERs). VER's are species and habitats present within the Zone of Influence<sup>9</sup> of the proposed development that are of sufficient value that an effect upon them could be considered significant.
- 8.3.25 The value of Designated Sites, habitats, species populations and species assemblages are evaluated with reference to their envisaged biodiversity conservation value (which relates to their rarity, sensitivity or replaceability), their legal status and any National or Local Conservation Status (taken from UK BAP and Local BAPs).
- 8.3.26 For the purposes of this EcIA, all VER's are valued at a geographical scale. This is as presented and explained in Table 8.2.

<sup>&</sup>lt;sup>9</sup> The Ecological Zone of Influence is an area in which a receptor maybe subject to effects as a result of the development. Such receptors are likely to include: Designated Sites; Notable Habitats; and, Protected Species. The Zone of Influence will vary depending on the type of impact and the sensitivity of the receptor being impacted upon.

# TABLE 8.2:SUMMARY OF THE FACTORS TAKEN INTO CONSIDERATION FOR BOTHHABITATS AND SPECIES WHEN DETERMINING VALUED ECOLOGICAL RECEPTORS

Value / Importance	Criteria
	Habitats
	An internationally designated site or candidate site (Special Protection Area (SPA), provisional SPA, Special Areas of Conservation (SAC), candidate SAC, Ramsar Site, Biogenetic / Biosphere Reserve, World Heritage Site) or an area that would meet the published selection criteria for designation.
International	A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole.
(European)	Species
	Any regularly occurring population of internationally important species, threatened or rare in the UK (i.e. a UK Red Data Book species categories 1 and 2 of the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP.
	A regularly occurring, nationally significant population / number of an internationally important species.
	Habitats
	A nationally designated site, Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Marine Nature Reserve (MNR)) or a discrete area, which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines).
National	A viable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat essential to maintain wider viability.
(English)	Species
	A regularly occurring, regionally or county significant population / number of an internationally / nationally important species.
	Any regularly occurring population of a nationally important species, threatened or rare in the region or county (see LBAP).
	A feature identified as of critical importance in the UK BAP.
	Habitats
	Sites that exceed the County-level designations, but fall short of SSSI selection criteria.
	Viable areas of key habitat identified in the Local BAP or smaller areas of habitat essential to maintain wider viability.
Regional	Species
(East of England)	Any regularly occurring, locally significant population of a species listed as being nationally scarce, which occurs in 16 of 100 10 km squares in the UK or in a Local BAP.
	A regularly occurring, locally significant population / number of a regionally important species. Sites maintaining populations of internationally / nationally important species that are not threatened or rare in the region or county.

Value / Importance	Criteria
Authority Area (e.g. County or District)	Habitats         Sites recognised by local authorities, e.g. County Wildlife Sites (CWS) and Sites of Interest for Natural Science (SINS).         County / District sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves (LNR).         A viable area of habitat identified in County / District (Local) BAP.         A diverse and / or ecologically valuable hedgerow network. Semi-natural ancient woodland greater than 0.25 ha.         Species         Any regularly occurring, locally significant population of a species listed in a County / District (Local) BAP due to regional rarity or localisation.         A regularly occurring, locally significant population of a species of county / district importance.         Sites supporting populations of internationally / nationally / regionally important species that are not threatened or rare in the region or county, and not integral to maintaining those populations.         Sites / features scarce in the county / district or that appreciably enrich the county / district
	habitat resource.
Local	Habitats         Areas of habitat that appreciably enrich the local habitat resource (e.g. species-rich hedgerows, ponds).         Sites that retain other elements of semi-natural vegetation that, due to their size, quality or the wide distribution within the local area, are not considered for the above classifications.         Species         Populations / assemblages of species that appreciably enrich the biodiversity resource within the local context.         Sites supporting populations of species of county / district importance that are not threatened or rare in the region or county, and are not integral to maintaining those populations.
Site (Immediate Local Area or Village Importance)	<u>Habitats</u> Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest. <u>Species</u> A good example of a common or widespread species.
Less than Local / Site Level (Limited Ecological Importance)	Sites that retain habitats and / or species of limited ecological importance due to their size, species composition or other factors.
- 8.3.27 Within this assessment, sites, species populations or assemblages and habitats are considered to be VER's if they are considered to be of Local Importance or higher.
- 8.3.28 There is also the potential that the HV Electrical Connection will have an impact on species which have not been deemed VERs but still have a level of legal protection (i.e. bats which are protected by the Habitat Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended)) and, if not present on site, could easily pass through transiently. In these cases, the impacts have been considered alongside the EcIA of the VERs.

#### Identification and Characterisation of the Potential Impacts

- 8.3.29 Based on the assimilated baseline conditions and an understanding of the proposed works, the potential impacts to ecological receptors have been identified. The potential impacts cover the construction and operation of the HV Electrical Connection.
- 8.3.30 Impacts have been assessed against the baseline conditions and have been characterised with reference to ecological structure and function of the feature in question, for instance the fragility / stability of an ecosystem and its connectivity to other features or resources.
- 8.3.31 The following parameters have been referred to in assessing effects on ecological structure and function:
  - Positive or negative;
  - Magnitude (high, medium, low or negligible);
  - Extent;
  - Duration;
  - Reversibility; and
  - Timing and frequency.
- 8.3.32 Professional judgement is used to assess and assign these effects to each VER. Where relevant, details are provided within the EcIA to provide transparency in how a decision over whether an impact is significant or not has been reached.

#### Assessment of Significance

- 8.3.33 For the purposes of this EcIA, an ecologically significant impact is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and / or the conservation status of habitats or species within a given geographical area. If an impact is found not to be significant at the level at which the resource or feature has been valued, it may still be significant at a smaller geographical scale.
- 8.3.34 The assessment of significance takes account of any designed-in mitigation measures.
- 8.3.35 The degree of significance has been indicated within the EcIA as positive or adverse, and minor, moderate or major.

#### 8.4 Ecological Baseline

- 8.4.1 The initial Survey Area for the Phase 1 Habitat Survey comprised the indicative HV Electrical Connection route and a buffer area approximately 50 m either side. A wider buffer area was not considered necessary given the proximity of established industrial depots and complexes, and their associated infrastructure.
- 8.4.2 Given the length of the HV Electrical Connection route and the diversity of habitats it bisects, the Survey Area was divided into three distinct 'Sections'. These Sections

each comprised broadly similar habitat types. The use of separate Sections allows for an easier, more practicable assessment.

8.4.3 These three Sections are summarised below.

• Section 1:

The western most Section is located within the operational LG Development construction site.

This area currently comprises a haul road which provides access to the construction sites and is subsequently dominated by bare open ground and hardstanding.

No vegetation of significance is present.

A disused railway line which supports dense continuous scrub is located immediately to the east of the temporary haul road and forms the boundary to the LG Development site.

The dominant scrub species are buddleia (*Buddleia davidii*), bramble (*Rubus fruticosus* agg.), and silver birch (*Betula pendula*), with various grasses dominating the ground flora.

This area of scrub widens at the northern end where it abuts Section 2.

• Section 2:

Section 2 is the northern section and is dominated by the A1014 (The Manorway). The A1014 (The Manorway) traverses east to west through the centre of this Section.

This area comprises hardstanding, amenity grassland, semi-improved grassland, inundation vegetation, dense scrub and semi-natural broad-leaved woodland.

The A1014 (The Manorway) itself is dominated by hardstanding and is flanked by a combination of grassland and scrub and small isolated patches of semi-mature broad-leaved woodland. One wet and one dry ditch are also present, to the north and south of the A1014 (The Manorway), but are somewhat hidden within the dense scrub.

The land to the south of A1014 (The Manorway) (adjacent to Section 1) comprises a large area of dense scrub habitat and a parking area associated with the LG Development. The scrub habitat was dominated by buddleia, bramble and silver birch.

The land to the south of A1014 (The Manorway) (adjacent to Section 3) is dominated by the disused railway corridor. The tracks are still visible with the ballast maintaining a thin linear strip of bare ground but the bramble and buddleia has encroached elsewhere to form thick areas of dense scrub.

The land to the north of A1014 (The Manorway) is dominated by the Manorway Fleet, a deep water course which supports a significant coverage of reeds (*Phragmites* sp.). The semi-improved grassland of the Northern Triangle Receptor site<sup>10</sup> is located further north of the Manorway Fleet.

• Section 3:

The eastern most Section is the most biologically diverse. It is formed of two large unmanaged grassland fields divided by an access road running east to

<sup>&</sup>lt;sup>10</sup> The Northern Triangle is one of the key ecological receptor sites established by DP World during the vegetation clearance works of the adjacent LG Development. The Northern Triangle is currently managed for Great Crested Newt under a Natural England European Protected Species Licence.



west towards the Shell Aviation Oil Depot. Together, the fields form a strip of grassland and scrub sandwiched between various industrial complexes.

The northern field comprises rank semi-improved grassland to the north-east, intermittently scattered with scrubland species such as hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*). This scrub becomes more dense and dominates the south-western corner of the field. Patches of immature silver birch were situated amongst the scrub. The open grassland and dense scrub are divided by a chain link fence and a narrow wet ditch forms the northern boundary with Section 2.

The southern-most field is larger and dominated by rank semi-improved grassland. A one metre wide wet ditch runs from east to west through the middle of the site. A small pond is located approximately 10 m to the north of the ditch. Areas of scattered scrub, hardstanding and tall ruderal vegetation are located infrequently throughout the area.

#### **Ecological Features**

- 8.4.4 Combined, the Desk Study and the initial Phase 1 Habitat Survey confirmed that the survey area could support a variety of ecological features, each of which has the potential to be a VER.
- 8.4.5 The ecological features, and a justification of whether they qualify as VERs, are presented in Table 8.3.
- 8.4.6 Further details and justification are provided within the Phase 1 Habitat Survey (and, where relevant, the Phase 2 Protected Species Surveys) presented in the Ecological Surveys Volume.



# TABLE 8.3: SUMMARY OF WHICH ECOLOGICAL FEATURES QUALIFY AS VALUEDECOLOGICAL RECEPTORS

Ecological Feature	Likelihood of Presence	Value / Importance	VER
Statutory Designated Sites	Vange and Fobbing Marshes SSSI is located 900 m north of the survey area. This is considered to be outside the Zone of Influence.	N / A	No
Non-Statutory Designated Sites	Corringham Marshes Site of Importance for Nature Conservation (SINC), predominantly designated as grazing marsh, is located within 100 m of the proposed route of the HV Electrical Connection.	County	Yes
LG Development Ecological Receptor Sites	The Northern Triangle, (an LG Development Ecological Receptor Site) is located to the north of the A1014 (The Manorway). If the Preferred Option is employed, the HV Electrical Connection would lie to the south of the Northern Triangle (and of the Manorway Fleet). If the Manorway Fleet / Northern Triangle Option is employed, the HV Electrical Connection would lie inside the Northern Triangle (and cross the Manorway Fleet). This site is managed for its population of GCN.	County	Yes
UK and Local BAP Habitats	Open standing water, broad-leaved woodland and marsh and / or swamp are UK BAP habitats. Wetlands (including grazing marsh and reedbeds) and woodlands are Essex BAP habitats. Roadside verges and reedbeds are also Thurrock BAP habitats. These habitats are present within Section 2. Ponds are listed as an Essex BAP habitat. Brownfield wildlife land is listed as a Thurrock BAP habitat. These habitats are present within Section 3.	National / County / District	Yes
Floral Species	All habitats recorded are relatively common and / or widespread within the local area.Toral SpeciesThe interconnected mosaic of rank grassland, scrub, scattered trees and several water bodies of Section 3 offered the most botanical interest. No protected or notable species were recorded.N / A		No
Badgers	All information pertaining to Badgers is provided in the Confidential Ecological Survey Volume (Badger Assessment / Report).	All information pertaining to Badgers is provided in the Confidential Ecological Survey Volume (Badger	
Dormice	The survey area supports limited habitat. The patches of dense scrub and woodland could potentially support this species but they are largely isolated and fragmented from other more suitable habitats. As such, it is highly unlikely that this species is present.	N / A	No

Ecological Feature	Likelihood of Presence	Value / Importance	VER
Bats	Bats are known to be present within the wider area but no potential roost sites were recorded within Sections 1 or 2. A linear row of willow and poplar trees with minimal potential to support roosting bats was recorded to the north east of Section 3. However, these trees will not be directly affected by the proposed route. The linear vegetation present within Sections 2 and 3 could provide possible commuting routes and / or foraging sites for some bats. However, the area is already well lit and somewhat isolated by the surrounding industrial sites.	N / A	Precautionary Yes
Breeding Birds	Scrub habitat suitable to support breeding birds was recorded within Sections 2 and 3. Linear areas of the scrub within Section 3 are likely to be directly affected. Scrub is relatively common place throughout the local area and only common bird species were incidentally recorded during the site surveys.	N / A	Precautionary Yes
Wintering Birds	The scrub habitat is considered suitable to support common and widespread species throughout the winter. The limited geographical extent of the survey area restricts it from supporting large or important populations of wintering birds.	N / A	No
Water Voles	Water Voles are known to be present in abundance within the Northern Triangle (which includes the Manorway Fleet). Several water vole feeding stations and latrines were recorded within Section 3.Local		Yes
Otter	Despite the presence of water bodies within Sections 2 and 3, they are not considered suitable to support this species. Otters are therefore not considered likely to be present.	esence of water bodies within Sections 2 and t considered suitable to support this species. N / A No refore not considered likely to be present.	
Reptiles	Three common species (common lizard ( <i>Zootoca vivipara</i> ), slow worm ( <i>Anguis fragilis</i> ) and adder ( <i>Vipera berus</i> )) were recorded within Section 3 in small population numbers. Grass snakes are known to be present to the north of Section 2 in the Northern Triangle (which includes the Manorway Fleet). These species are likely to be directly affected.	Local	Yes

Ecological Feature	Likelihood of Presence	<i>Value / Importance</i>	VER	
	No GCN were recorded within Section 1 and Section 3. A large meta-population of GCN is present within north of Section 2 in the Northern Triangle (which includes the Manorway Fleet).			
GCN	Another large population is located within another LG Development Receptor Site, approximately 500 m to the west of Section 2.	County	Yes	
	Given the local areas' importance for GCN, and given the species ability to migrate hundreds of metres, the terrestrial habitats present are considered to be suitable for GCN.			
Terrestrial Invertebrates	The grazing marshes located to the north of Section 2 are known to support a diverse assemblage of terrestrial invertebrates, which includes some nationally scarce species.	the north of Section 2 are emblage of terrestrial ome nationally scarce Local Yes   s within Section 3 is Yes		
The mosaic of different habitats within Section 3 is considered suitable to support terrestrial invertebrates.				
Aquatic Invertebrates	No white-claw crayfish have been historically recorded within the wider area. The water bodies on site are also considered to be unsuitable for this species. The water bodies on site have the potential to support other aquatic species but are very widespread and common place within the wider area.	N / A	No	



#### Summary

8.4.8

Table 8.4 summarises Table 8.3 in terms of the sites, habitats and species which have been identified as VERs using the criteria specified in Section 8.3.

#### TABLE 8.4: SUMMARY OF VERS

Valued Ecological Receptor	Nature Conservation Value
Corringham Marshes SINC	County
Northern Triangle Receptor Site	Regional
UK and Local BAP Habitats	National / County / District
Badgers	All information pertaining to Badgers is provided in the Confidential Ecological Survey Volume (Badger Assessment / Report).
Bats*	N/A
Breeding Birds*	N/A
Water Voles	Local
Reptiles	Local
GCN	County
Terrestrial Invertebrates	Local

\* Have been designed as VERs on a 'Precautionary Yes' basis.

#### 8.5 Potential Impacts

#### **Construction Impacts**

- 8.5.1 The EcIA is based upon potential impacts to VERs. No consideration is given to other ecological receptors, which have been scoped out of this EcIA.
- 8.5.2 The potential impacts of the proposed development of the HV Electrical Connection are identified as follows:
  - Temporary habitat loss;
  - Temporary habitat fragmentation;
  - Direct mortality, injury and / or destruction of notable and protected species and habitats during site clearance and construction;
  - Direct and indirect disturbance to the ecological receptor from construction activities (including visual / noise / vibration and lighting); and,
  - Pollution caused by use of hazardous materials and incidental release of chemicals, fuels or waste materials.
- 8.5.3 Table 8.5 presents the envisaged potential impacts derived from the construction of the Preferred Option and Manorway Fleet / Northern Triangle Option of the HV Electrical Connection and makes an assessment of their magnitude and significance. It should be noted that in determining the residual magnitude and significance of the impact, it has been assumed that the mitigation (as described in sub-Section 8.6) has been implemented.

VER	Type of Impact	Impact Assessment	Significance of Impact Prior to Mitigation	Proposed Mitigation and Residual Impact Assessment	Significance o Impact After Mitigation
Corringham	Direct Disturbance / Contamination	For the Preferred Option and the Manorway Fleet / Northern Triangle Option, the construction works will be located approximately 100 m to the south of this Designated Site. As such there will be no direct impacts (i.e. direct disturbance / direct contamination).	Not Significant	N/A	N/A
Marshes SINC	Indirect Disturbance / Contamination	For the Preferred Option and the Manorway Fleet / Northern Triangle Option, the construction works may give rise to indirect impacts (i.e. indirect disturbance / indirect contamination). Unmitigated, these impacts are considered to be temporary, of low magnitude and easily reversible.	Minor Adverse	Implementation of the CEMP and Best Practice Methodologies will restrict any indirect disturbance / contamination. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significa
	Direct Disturbance / Contamination	For the Preferred Option, the construction works will likely be located to the south of this Receptor site. As such there will be no direct impacts (i.e. direct disturbance / direct contamination).	Not Significant	N/A	N/A
Northern Triangle Receptor Site	Direct Disturbance / Contamination	For the Manorway Fleet / Northern Triangle Option, the construction works may give rise to direct impacts (i.e. direct disturbance / direct contamination). Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible. Species-specific impacts are considered below.	Moderate Adverse	Implementation of the CEMP and Best Practice Methodologies (to include full re-instatement of any habitats / vegetation impacts) will restrict any direct disturbance / contamination. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significa

TABLE 8.5: ASSESSMENT OF THE IMPACT ON VERS DURING THE CONSTRUCTION OF THE HV ELECTRICAL CONNECTION

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VER	Type of Impact	Impact Assessment	Significance of Impact Prior to Mitigation	Proposed Mitigation and Residual Impact Assessment	Significance of Impact After Mitigation
	Indirect Disturbance / Contamination	For the Preferred Option and the Manorway Fleet / Northern Triangle Option, the construction works may give rise to indirect impacts (i.e. indirect disturbance / indirect contamination). Unmitigated, these impacts are considered to be temporary, of low magnitude and easily reversible. Species-specific impacts are considered below.	Minor Adverse	Implementation of the CEMP and Best Practice Methodologies (to include full re-instatement of any habitats / vegetation impacts) will restrict any indirect disturbance / contamination. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant
UK and Local	Direct Habitat	For the Preferred Option, the construction works will result in the adverse loss of small sections of BAP Habitats (principally roadside verges in Section 2). Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	Moderate Adverse	Implementation of the CEMP, Best Practice Methodologies and BAP Habitat Mitigation (to include full re- instatement of any habitats / vegetation impacts) will restrict direct habitat loss. In addition, the presence of similar adjacent habitat allows the wider landscape to maintain its function and continue supporting the local flora and fauna. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant
BAP Habitats	Loss	For the Manorway Fleet / Northern Triangle Option, the construction works will result in the adverse loss of small sections of BAP Habitats (principally grazing marsh in Section 2). Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	Moderate Adverse	Implementation of the CEMP, Best Practice Methodologies and BAP Habitat Mitigation (to include full re- instatement of any habitats / vegetation impacts) will restrict direct habitat loss. In addition, the presence of similar adjacent habitat allows the wider landscape to maintain its function and continue supporting the local flora and fauna. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant

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-	Bats Loss	Badgers All information p Report).	Direct Disturbance / Contamination	VER Type of Impact	PARSONS BRINCKERHOFF
nmental Report	For the Preferred Option and the Manorway Fleet / Northern Triangle Option, it is not considered that there will be any direct impacts on any potential roost sites. In addition, it is not considered that there will be any bisection of significant linear habitat. Some limited foraging habitat could occur. Unmitigated, these impacts are considered to be temporary, of low magnitude and easily reversible.	vertaining to Badgers is provided in the Com	For the Preferred Option and the Manorway Fleet / Northern Triangle Option, the remaining confirmed areas of BAP Habitats (open standing water, broad-leaved woodland, marsh and swamp (UK BAP) / Grazing marsh, reedbeds and woodlands (Essex BAP) / brownfield land and ponds (Thurrock BAP)) could be directly subject to direct impacts (i.e. direct disturbance / direct contamination). Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	Impact Assessment	
	Minor Adverse	fidential Ecological Su	Moderate Adverse	Significance of Impact Prior to Mitigation	
Drepared b	Implementation of the CEMP, Best Practice Methodologies and Precautionary Measures relating to Bats will restrict any permanent direct habitat loss. Furthermore, any temporary habitat loss will be limited by the provision of suitable replacement habitat once construction works are completed. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	ırvey Volume (Badger Assessment /	Implementation of the CEMP, Best Practice Methodologies and BAP Habitat Mitigation will restrict direct disturbance / contamination. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Proposed Mitigation and Residual Impact Assessment	
J	Not Significant	Not Significant	Not Significant	Significance of Impact After Mitigation	

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Significance of Impact After Mitigation	Not Significant	Not Significant
Proposed Mitigation and Residual Impact Assessment	Implementation of the CEMP, Best Practice Methodologies and Precautionary Measures relating to Bats will restrict any direct / indirect disturbance. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Implementation of the CEMP, Best Practice Methodologies and Precautionary Measures relating to Breeding Birds will restrict any permanent habitat loss. Furthermore, any temporary habitat loss will be mitigated by the provision of suitable replacement habitat once construction works are completed. Accordingly, mitigated to be temporary and negligible.
Significance of Impact Prior to Mitigation	Minor Adverse	Minor Adverse
Impact Assessment	For the Preferred Option and the Manorway Fleet / Northern Triangle Option, suitable habitat could be directly / indirectly disturbed by noise / lighting due to the construction works. However, due to the proximity of the A1014 (The Manorway), the area is already subject to relatively high levels of road traffic and industrial noise / lighting. Unmitigated, these impacts are considered to be temporary, of low magnitude and easily reversible.	For the Preferred Option and the Manorway Fleet / Northern Triangle Option, it is considered that there may be limited direct impacts on potentially suitable habitat as a result of vegetation clearance works. However, vegetation clearance will be undertaken outside the bird nesting season. Unmitigated, these impacts are considered to be temporary, of low magnitude and easily reversible.
Type of Impact	Direct / Indirect Disturbance	Direct Habitat Loss
VER		Breeding Birds

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VER	Type of Impact	Impact Assessment	Significance of Impact Prior to Mitigation	Proposed Mitigation and Residual Impact Assessment	Significance of Impact After Mitigation
	Direct / Indirect Disturbance	For the Preferred Option and the Manorway Fleet / Northern Triangle Option, habitat could be directly / indirectly disturbed by noise / lighting due to the construction works. However, due to the proximity of the A1014 (The Manorway), the area is already subject to relatively high levels of road traffic and industrial noise / lighting. Unmitigated, these impacts are considered to be temporary, of low magnitude and easily reversible.	Minor Adverse	Implementation of the CEMP, Best Practice Methodologies and Precautionary Measures relating to Breeding Birds will restrict any direct / indirect disturbance. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant
Water Voles (Section 1)	N/A	No suitable habitat was recorded, therefore no impacts are envisaged.	Not Significant	N/A	N / A
Water Voles (Section 2)	Direct Habitat Loss / Mortality / Disturbance	For the Preferred Option, the A1014 (The Manorway) and its associated cycle path do not provide suitable habitat for water voles. Furthermore, due to the proximity of the A1014 (The Manorway) the area is already subject to relatively high levels of road traffic and industrial noise / lighting. Therefore, there will be no direct impacts (i.e. direct habitat loss / mortality / disturbance) on water voles.	Not Significant	N/A	N/A

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VER	Type of Impact	Impact Assessment	Significance of Impact Prior to Mitigation	Proposed Mitigation and Residual Impact Assessment	Significance of Impact After Mitigation
		For the Manorway Fleet / Northern Triangle Option, there could be the potential for direct impacts on water voles. These direct impacts on water voles. These direct impacts will be dependent upon the exact locations for the HDD drilling sites. Direct impacts could include: habitat loss; and, mortality and / or disturbance on individual water voles if the works are located in close proximity to any water courses / water bodies. Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	Moderate Adverse	Implementation of the CEMP (including the Water Vole Method Statement) and Best Practice Methodologies will restrict any direct impacts. The key mitigation will be to avoid works in close proximity to water courses / water bodies. Furthermore, due to the proximity of the A1014 (The Manorway) the area is already subject to relatively high levels of road traffic and industrial noise / lighting. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant
Water Voles (Section 3)	Direct Habitat Loss / Mortality / Disturbance	The proposed route has been altered to avoid significantly fragmenting any water bodies. However, it will still bisect a small section of a linear wet ditch where the ditch abuts and passes under the Access Road to the Shell Tank Farm. As such, the proposed route will result in the potential for direct impacts (habitat loss / mortality / disturbance) to water voles. Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	Moderate Adverse	Implementation of the CEMP (including the Water Vole Method Statement) and Best Practice Methodologies will restrict any direct impacts. Furthermore, given the limited extent of impacts and the presence of an estimated small population of water voles, the risk of direct mortality is considered highly unlikely. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant
Reptiles (Section 1)	Direct Habitat Loss / Mortality / Disturbance	The majority of Section 1 has been cleared of all habitats suitable for Protected Species. The only suitable habitat is located within the rail corridor which will not be directly affected. In addition, the rail corridor is protected by reptile proof fencing. Therefore, there will be no direct habitat loss / mortality / disturbance.	Not Significant	N/A	N/A

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VER	Type of Impact	Impact Assessment	Significance of Impact Prior to Mitigation	Proposed Mitigation and Residual Impact Assessment	Significance of Impact After Mitigation
Reptiles	Direct Habitat	For the Preferred Option, the A1014 (The Manorway) and its associated cycle path do not provide suitable habitat for reptiles. Furthermore, due to the proximity of the A1014 (The Manorway) the area is already subject to relatively high levels of road traffic and industrial noise / lighting. Therefore, there will be no direct impacts (i.e. direct habitat loss / direct mortality / disturbance) on reptiles.	Not Significant	N/A	N/A
(Section 2)	/ Disturbance	For the Manorway Fleet / Northern Triangle Option, there could be the potential for direct impacts on reptiles as a result of vegetation clearance works. Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	Moderate Adverse	Implementation of the CEMP (including the Reptiles Method Statement) and Best Practice Methodologies will restrict any direct impacts. Any temporary habitat loss will be mitigated by the provision of suitable replacement habitat. Furthermore, due to the proximity of the A1014 (The Manorway) the area is already subject to relatively high levels of road traffic and industrial noise / lighting. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant

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Significance of Impact After Mitigation	Not Significant	N/A
Proposed Mitigation and Residual Impact Assessment	Implementation of the CEMP (including the Reptile Method Statement) and Best Practice Methodologies will restrict any direct impacts. Any temporary habitat loss will be mitigated by the provision of suitable replacement habitat. Furthermore, given the limited extent of impacts and the presence of an estimated small population of reptiles, the risk of direct mortality is considered highly unlikely. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	N/A
Significance of Impact Prior to Mitigation	Moderate Adverse	Not Significant
Impact Assessment	The proposed route will result in the proposed route will result in the potential for direct impacts (habitat loss / mortality / disturbance) to reptiles. Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	The majority of Section 1 has been cleared of all habitats suitable for Protected Species. The only suitable habitat is located within the rail corridor which will not be directly affected. In addition, the rail corridor is protected by reptile proof fencing, which would also prevent GCN access. Therefore, there will be no direct habitat loss.
Type of Impact	Direct Habitat Loss / Mortality	Direct Habitat Loss / Mortality / Disturbance
VER	Reptiles (Section 3)	GCN (Section 1)

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VER	Type of Impact	Impact Assessment	Significance of Impact Prior to Mitigation	Proposed Mitigation and Residual Impact Assessment	Significance of Impact After Mitigation
GCN	Direct Habitat	For the Preferred Option, the A1014 (The Manorway) and its associated cycle path do not provide suitable habitat for GCN. Furthermore, due to the proximity of the A1014 (The Manorway) the area is already subject to relatively high levels of road traffic and industrial noise / lighting. Therefore, there will be no direct impacts (i.e. direct habitat loss / direct mortality / disturbance) on GCN.	Not Significant	N/A	N / A
(Section 2)	/ Disturbance	For the Manorway Fleet / Northern Triangle Option, there could be the potential for direct impacts on GCN as a result of vegetation clearance works. Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	Moderate Adverse	Implementation of the CEMP (including the GCN Method Statement), Best Practice Methodologies and the Appropriate Licences will restrict any direct impacts. Any temporary habitat loss will be mitigated by the provision of suitable replacement habitat. Furthermore, due to the proximity of the A1014 (The Manorway) the area is already subject to relatively high levels of road traffic and industrial noise / lighting. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant

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VER	Type of Impact	Impact Assessment	Significance of Impact Prior to Mitigation	Proposed Mitigation and Residual Impact Assessment	Significance of Impact After Mitigation
GCN (Section 3)	Direct Habitat Loss / Mortality / Disturbance	No GCN were recorded within Section 3. However, it is acknowledged that GCN are present within the wider landscape and the terrestrial links could allow GCN to move into Section 3. Therefore, the proposed route may result in the potential for direct impacts (habitat loss / mortality / disturbance) to GCN. Unmitigated, these impacts are considered to be temporary, of medium magnitude and reversible.	Moderate Adverse	Implementation of the CEMP (including the GCN Method Statement) and Best Practice Methodologies will restrict any direct impacts. Furthermore, given the limited extent of impacts and the confirmed absence of GCN within Section 3 during the 2012 Phase 2 GCN Survey, the risk of direct mortality is considered highly unlikely. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant
Terrestrial Invertebrates (Section 1)	N/A	No suitable habitat was recorded, no impacts are envisaged.	Not Significant	N / A	N/A
		For the Preferred Option, the A1014 (The Manorway) and its associated cycle path do not provide suitable habitat for notable terrestrial invertebrates species or assemblages. Therefore, there will be no direct impacts (i.e. direct habitat loss / direct mortality) on terrestrial invertebrates.	Not Significant	N / A	A/N
Terrestrial Invertebrates (Section 2)	Direct Habitat Loss / Mortality / Disturbance	For the Manorway Fleet / Northern Triangle Option, the Northern Triangle provides habitats suitable for a range of terrestrial invertebrates. However, the construction works will be spatially and temporally limited. Therefore, it is considered that there may be limited direct habitat loss. Unmitigated, these impacts are considered to be temporary, of low magnitude and reversible.	Minor Adverse	Implementation of the CEMP and Best Practice Methodologies will restrict any direct impacts. Furthermore, any temporary habitat loss will be mitigated by the provision of suitable replacement habitat once construction works are completed. Accordingly, mitigated, these impacts are considered to be temporary and negligible.	Not Significant

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PARSON BRINCKE	SRHOFF				
VER	Type of Impact	Impact Assessment	Significance of Impact Prior to Mitigation	Proposed Mitigation and Residual Impact Assessment	Significance of Impact After Mitigation
Terrestrial Invertebrates (Section 3)	Direct Habitat _oss	One UK BAP Priority Species was recorded. This was the Brown-banded Carder Bee ( <i>Bombus humilius</i> ). No floral species on which this species depends were recorded indicating that the bee was passing across the site rather than being dependent on it. No Red Data Book Species were recorded, but seven Nationally Scarce Species were recorded. Given the extensive knowledge of the Surveyor of terrestrial invertebrates within the wider landscape, this assemblage is considered to be of Low Nature Conservation Value. There will therefore be no significant loss of valuable terrestrial habitat. Indeed, the temporary habitat removal across a small extent of the site could potentially result in an overall improvement. Therefore, there will be no direct habitat loss.	Not Significant	N	N

#### **Operational Impacts**

- 8.5.4 The following assessment (and associated discussion) is applicable to the Preferred Option and Manorway Fleet / Northern Triangle Option.
- 8.5.5 Following construction / installation of the HV Electrical Connection, habitats will be reinstated.
- 8.5.6 The HV Electrical Connection will be permanently buried along its entire length, and will be designed specifically to minimise any management / maintenance requirements, and will be operated in such a manner as to keep it in a good and safe condition.
- 8.5.7 Whilst it is noted that there may be permanent operational structures (including joint bays (or transitional bays) and marker posts / plates), it is anticipated that these will be low lying and located at appropriate locations (i.e. at the pre-agreed HDD drilling sites).
- 8.5.8 Accordingly, no potential impacts on ecology are anticipated.

#### 8.6 Mitigation

#### **Generic Mitigation to Avoid Impacts**

- 8.6.1 A CEMP will be implemented by the appointed Construction Contractor; and a Construction Best Practice Method Statement(s) will be developed, to demonstrate (amongst other things) how impacts on ecological receptors will be mitigated and managed throughout the construction process.
- 8.6.2 Details of the suggested contents of the CEMP have been provided in Section 7.4.
- 8.6.3 Accordingly, it is considered that the establishment of the CEMP will directly offset the construction impacts in terms of: habitat degradation; general disturbance; and, contamination.

#### Species-Specific Mitigation

#### **Biodiversity Action Plan Habitats**

- 8.6.4 Post-construction, all disturbed, damaged and removed habitats will be reinstated, with (at least) like for like. As such the landscape would be returned to predevelopment conditions with grasslands re-seeded and riparian banks re-planted.
- 8.6.5 Due to the temporary nature of the construction works, the lack of any long term / permanent adverse impacts and the narrow nature of the working corridor, it is unlikely that any further compensation (such as habitat creation or manipulation) would be required.
- 8.6.6 Indeed, the dominance of several industrial sites, the LG Development and several designated sites restricts the ability to provide any significant gains in BAP habitat.

#### Badgers

8.6.7 All information pertaining to Badgers is provided in the Confidential Ecological Survey Volume (Badger Assessment / Report).

#### <u>Birds</u>

- 8.6.8 Precautionary measures to be undertaken include:
  - A Toolbox Talk should be presented to all construction personnel / employees highlighting the legal obligations, identification and the ecology of this species.
  - The use of Best Practice Methodologies.

- The clearance of scrub, shrubs and trees works outside of the breeding bird season (which is generally taken to be February to August for most species).
- The requirement for an experienced Ecologist to be present should any significant and large areas of scrub, shrubs and trees need to be removed within the breeding bird season. If active nests are recorded, a buffer zone of 10 m around the nest should be established. No works should be permitted within this buffer until the young are no longer dependant on the nest.
- The requirement for works to be undertaken during daylight hours and all lighting will to be directional and sensitive to the surrounding habitats.

#### **Bats**

8.6.9

Precautionary measures to be undertaken include:

- A Toolbox Talk should be presented to all construction personnel / employees highlighting the legal obligations, identification and the ecology of this species.
- The use of Best Practice Methodologies.
- The requirement for works to be undertaken during daylight hours (i.e. restricted to between 07:00 hrs and 19:00hrs) and all lighting will to be directional and sensitive to the surrounding habitats.
- The continued liaison with an experienced Ecologist.

#### Water Voles

- 8.6.10 The key mitigation will be to avoid works in close proximity to water courses / water bodies.
- 8.6.11 In addition, a Water Vole Method Statement will be included in the CEMP.
- 8.6.12 The Water Vole Method Statement will include precautionary measures to be undertaken when working within proximity to, or directly bisecting, any water bodies. Accordingly, the Water Vole Method Statement will include (but not be limited to) the following recommendations:
  - A Toolbox Talk should be presented to all construction personnel / employees highlighting the legal obligations, identification and the ecology of this species.
  - Works that may impact individual water voles or their burrows should be undertaken under the supervision of a qualified Ecologist to ensure that all works are undertaken professionally and in accordance with the CEMP.
  - Working hours should be restricted to daylight hours to minimise any excessive disturbance to water voles.
  - Water voles should be displaced from the working width (working corridor) using habitat displacement / habitat manipulation methods<sup>11</sup> to avoid injury or mortality. Vegetation along the water body that falls within the working width (working corridor) should be cleared in a directional way. This should occur at the beginning of the breeding season (from mid-February, but before April as per Standard Guidelines).
  - Before any clearance of vegetation, all burrows within the area will need to be identified, checked and marked. Burrows will need to remain open to enable animals to escape.

<sup>&</sup>lt;sup>11</sup> It should be noted that habitat displacement / habitat manipulation methods rely on the area being maintained as unsuitable for water voles throughout the construction works. However, they are also subject to the mitigation requirements of other protected species.

- Cleared areas may need to be left for up to seven days, to allow time for water voles to leave the area naturally. Regular checks of burrows should be made by a water vole specialist throughout this period and the re-cutting of vegetation may be required.
- Burrows found within the working area will have to be excavated by hand following the vegetation removal and time allowed for water voles to have left the area naturally.
- Buffer zones<sup>12</sup> of approximately 10 m should be implemented by the installation of appropriate hazard fencing around the water bodies in order to minimise direct and indirect impacts on water voles. These buffer zones should prevent construction personnel / employees from entry into such water body areas. The use of buffer zones would also preclude the storage of materials and heavy plant machinery within these areas.
- Following the completion of construction works, habitat should be replanted or allowed to naturally re-colonise to ensure there is no net or permanent loss of water vole habitat across the area.
- 8.6.13 In addition, due to the presence of water voles within the wider surrounding area, any other water bodies that will be directly impacted will be subject to the above mitigation as a precaution.
- 8.6.14 If the Preferred Option is pursued, it is not considered necessary to consult further with Natural England. However, in the event that water voles are recorded during any stage of the construction, all construction works will cease and an experienced Ecologist will be contacted immediately. Further consultation with Natural England will be required.
- 8.6.15 If the Manorway Fleet / Northern Triangle Option is pursued (and water vole habitat cannot be avoided), then it will be necessary to agree the specific mitigation measures and content of the Water Vole Method Statement with Natural England.

#### **Reptiles**

- 8.6.16 A Reptile Method Statement will be included in the CEMP.
- 8.6.17 The Reptile Method Statement will include precautionary measures to be undertaken at all times. Accordingly, the Reptile Method Statement will include (but not be limited to) the following recommendations:
  - A Toolbox Talk should be presented to all construction personnel / employees highlighting the legal obligations, identification and the ecology of this species.
  - Works should be undertaken under the supervision of a qualified Ecologist to ensure that all works are undertaken professionally and in accordance with the CEMP.
  - Reptiles should be displaced from the working width (working corridor) using habitat manipulation methods<sup>13</sup> to avoid injury or mortality. This should occur during the reptile most active months (generally agreed to be between April and June and during September). The displacement should be undertaken using habitat manipulation in a staged approach over a number of days, to allow reptiles to naturally move out of the area. The cutting regime should be directional towards suitable habitat to encourage reptiles to move into the

<sup>&</sup>lt;sup>12</sup> English Nature (2001) Water Vole Mitigation Techniques: A Questionnaire Research Project. No. 415 – English Nature Research Reports.

<sup>&</sup>lt;sup>13</sup> Habitat manipulation should be undertaken with consideration / in accordance with other Protected Species mitigation, such as for badgers.



adjoining habitat. The "working width" must be maintained devoid of vegetation throughout the period of construction works.

- If works are undertaken during / extend over the winter months, targeted vegetation clearance would be necessary. This should include the removal of vegetation (which will also be required as part of the measures to avoid directly impacting GCN) and is aimed to render the working width / working corridor unsuitable for this species. In addition, the working width / working corridor must be maintained devoid of vegetation throughout the period of construction works. However, any suitable hibernacula must be left in situ throughout the winter months and dismantled by hand under the supervision of an Ecologist once the hibernation period is over.
- Any hibernacula (piles of wood, stones or dead vegetation) should be taken apart by hand by an experienced Ecologist and any reptiles found moved to a safe location off site.
- Following completion of the construction works, habitat should be reinstated to ensure there is no net or permanent loss of reptile habitat across the area.
- 8.6.18 In the event that reptiles are recorded during any stage of the construction, all construction works should cease, and the reptile should be given time to move out of the working width / working area naturally, and an experienced ecologist should be contacted immediately.
- 8.6.19 Due to the localised and temporary nature of the works, reptile fencing or translocation of reptiles from the working width / working area is not considered necessary.

Great Crested Newts

- 8.6.20 A GCN Method Statement will be included in the CEMP.
- 8.6.21 The GCN Method Stated will include precautionary measures to be undertaken at all times. Accordingly, the GCN Method Statement will include (but not be limited to) the following recommendations:
  - A Toolbox Talk should be presented to all construction personnel / employees highlighting the legal obligations, identification and the ecology of this species.
  - GCNs should be displaced from the "working width" using habitat manipulation methods<sup>14</sup> to avoid injury or mortality. This should occur during the GCN active season (generally between March / April and September / October). The displacement should be undertaken using habitat manipulation in a staged approach over a number of days, to allow GCNs to naturally move out of the area. The cutting regime should be directional towards suitable habitat to encourage GCNs to move into the adjoining habitat. In addition, the working width / working corridor must be maintained devoid of vegetation throughout the period of construction works. This habitat displacement technique will be required for both GCN and reptiles as described above.
  - Any hibernacula (piles of wood, stones or dead vegetation) should be taken apart by hand by an experienced Ecologist and any reptiles found moved to a safe location off site.
  - If works are undertaken during / extend over the winter months, targeted vegetation clearance would be necessary. This should include the removal of vegetation (which will also be required as part of the measures to avoid directly impacting reptiles) and is aimed to render the working width / working corridor

<sup>&</sup>lt;sup>14</sup> Habitat manipulation should be undertaken with consideration / in accordance with other Protected Species mitigation.

unsuitable for this species. In addition, the working width / working corridor must be maintained devoid of vegetation throughout the period of construction works. However, any suitable hibernacula must be left *in situ* throughout the winter months and dismantled by hand under the supervision of an Ecologist once the hibernation period is over.

- Works should be undertaken under the supervision of a qualified Ecologist to ensure that all works are undertaken professionally and in accordance with the CEMP.
- As a measure of best practice, if any smooth newts, common frogs or common toads are found during the construction works they should be removed carefully by hand to areas away from the working width / working corridor.
- Following completion of the construction works, habitat should be reinstated.
- 8.6.22 If the Preferred Option is pursued, it is not considered necessary to obtain a Natural England Development Licence. In the event that GCN be recorded during any stage of the construction, all construction works will cease and an experienced ecologist and / or Natural England will be contacted immediately. In this instance, it is likely that a Development Licence maybe subsequently required.
- 8.6.23 If the Manorway Fleet / Northern Triangle Option is pursued, it will be necessary to obtain a Natural England Licence and Development Licence in order for the construction works to proceed.

#### Terrestrial Invertebrates

- 8.6.24 It has been confirmed that the site is not considered valuable for this species group and there will be no overall loss of invertebrate ecology. Indeed, the proposed HV Electrical Connection could potentially result in a net improvement for invertebrates through a forced diversification of the herbaceous flora.
- 8.6.25 No formal mitigation measures are therefore considered necessary. However, it will be ensured that the post construction planting uses a seed mix which will benefit invertebrates. This will not include the planting of trees or perennial rye grass, or similar competitive grass species.

#### 8.7 Summary

- 8.7.1 The Phase 1 Habitat Survey found that there is limited potential for protected or notable species and habitats. Further Phase 2 Protected Species Surveys were undertaken to establish if these protected / notable species and habitats were present.
- 8.7.2 Cumulatively the Surveys found there to be a Non-Statutory Site present within 100 m of the HV Electrical Connection route, and the presence of:
  - Badgers;
  - Water Voles;
  - Reptiles; and,
  - Terrestrial Invertebrates.
- 8.7.3 These were deemed to be VERs. GCN, bats and breeding birds were also valued as a VER on a precautionary basis.
- 8.7.4 The construction of the HV Electrical Connection may result in the following impacts: habitat loss; habitat fragmentation; mortality; disturbance; and, contamination. Without mitigation, significant impacts (of minor adverse nature) could occur on the VERs. In addition, the construction works could result in contravention of the

legislation protecting a number of species. In order to reduce the impacts and ensure legal compliance, mitigation measures have been proposed. These include both generic measures (such as implementation of a CEMP) and specific measures. Once the mitigation measures have been put into place, all impacts on VERs will be reduced to not significant.

- 8.7.5 Following construction / installation of the HV Electrical Connection, habitats will be reinstated.
- 8.7.6 The HV Electrical Connection will be permanently buried along its entire length, and will be designed specifically to minimise any management / maintenance requirements, and will be operated in such a manner as to keep it in good and safe condition.
- 8.7.7 Whilst it is noted that there may be permanent operational structures (including joint bays (or transitional bays) and marker posts / plates), it is anticipated that these will be low lying and located at appropriate locations (i.e. at the pre-agreed HDD drilling sites).
- 8.7.8 Accordingly, no potential residual impacts on ecology are anticipated.

#### 9 WATER RESOURCES ASSESSMENT

#### 9.1 Introduction

- 9.1.1 This Section presents the results of the Water Resources Assessment.
- 9.1.2 This Section has been prepared to support and confirm the results of the Screening Process presented in Section 2 (The Purpose and Scope of the Environmental Report).
- 9.1.3 In particular this Section considers:
  - Any inland / coastal / marine / underground water on or around the site which could be affected by the Project; and,
  - Whether the Project site is susceptible to earthquakes / subsidence / landslides / erosion / flooding or extreme or adverse climatic conditions (e.g. temperature inversions / fogs / severe winds) which could cause the Project to present environmental problems.

#### 9.2 Consultation with the Environment Agency

- 9.2.1 Initial consultation with the Environment Agency was undertaken to determine the scope of the Water Resources Assessment.
- 9.2.2 The initial consultation was based on an initial proposed route for the HV Electrical Connection which crossed the Manorway Fleet at two locations (This is shown in Insert 4.1).
- 9.2.3 In summary (and in line with the Screening Process), the initial consultation with the Environment Agency indicated a need for an assessment of:
  - Water Resources (in particular with respect to crossing the Manorway Fleet);
  - Flood Risk (at the National Grid Coryton South Substation site); and
  - Land Contamination.
- 9.3 Developments Subsequent to Consultation with Environment Agency
- 9.3.1 Following the initial consultation with the Environment Agency, a number of revisions took place to the initial proposed route for the HV Electrical Connection. Of particular importance is that the 'Preferred Option' was developed (previously the 'Manorway Fleet / Northern Triangle Option' was presented).

#### 9.4 Scope and Structure of this Section

- 9.4.1 In line with the Screening Process and the initial consultation with the Environment Agency, this Section contains an assessment of:
  - Water Resources (in particular with respect to crossing the Manorway Fleet);
  - Flood Risk (at the National Grid Coryton South Substation site); and,
  - Land Contamination.
- 9.4.2 For each of these assessments, the initial assessment (and associated discussion) is provided assuming that none of the final build will be within the Manorway Fleet or the Northern Triangle. This assessment and associated discussion is provided as the 'Preferred Option'.
- 9.4.3 However, the subsequent assessment (and associated discussion) is provided to cover the eventuality that the HV Electrical Connection is installed within the Manorway Fleet / Northern Triangle. This assessment and associated discussion is provided as the 'Manorway Fleet / Northern Triangle Option'.

# 9.5 Assessment of Water Resources (in particular with respect to crossing of the Manorway Fleet)

- 9.5.1 There is no Water Framework Directive (WFD) data available for the Manorway Fleet.
- 9.5.2 The closest waterbody to the Manorway Fleet for which WFD data is available from the Environment Agency is the Mardyke and Fobbing (Waterbody ID: GB106037028010). This is a heavily modified water body with a Current Ecological Status of 'Moderate Potential'. The Target Ecological Status for 2015 for this water body is also of 'Moderate Potential'. Given that there is no WFD data available for the Manorway Fleet itself, it has been assumed that the Manorway Fleet is of the same Current Ecological Status and has the same Target Ecological Status for 2015 as the Mardyke and Fobbing.
- 9.5.3 The chemical quality of the Mardyke and Fobbing (and thus Manorway Fleet) does not require assessment under the WFD.

**Preferred Option - Requirement for an Assessment under the Water Framework Directive** 

- 9.5.4 Under the preferred option, the proposed route of the HV Electrical Connection contains no crossings of the Manorway Fleet and, as such, it is unlikely that there be any associated direct impacts on the Manorway Fleet.
- 9.5.5 Accordingly, it is also unlikely that the route of the HV Electrical Connection would result in adverse impacts on: watercourse ecology; hydro-morphology; and, water quality.
- 9.5.6 As such, it is considered unlikely that the construction / operation of the HV Electrical Connection would have an impact on the WFD Status of the Manorway Fleet.
- 9.5.7 It is also considered unlikely that the construction / operation of the HV Electrical Connection would have an impact on the ability of the Manorway Fleet to meet the Target Ecological Status for 2015.

Manorway Fleet / Northern Triangle Option - Requirement for an Assessment under the Water Framework Directive

9.5.8 Under the Manorway Fleet / Northern Triangle Option, the proposed route of the HV Electrical Connection would cross the Manorway Fleet (via HDD) at two locations and, as such, has potential for direct impacts on the Manorway Fleet. Accordingly, there is also the potential that the route of the HV Electrical Connection may result in adverse impacts on: watercourse ecology; hydro-morphology; and, water quality.

Scope of Assessment under the Water Framework Directive

- 9.5.9 The scope of assessment of water resources contains:
  - A description of the potential impacts on the Ecological Status of the Manorway Fleet; and,
  - Suggested mitigation / monitoring measures.

Potential Impacts on the Ecological Status of the Manorway Fleet

Construction

- 9.5.10 Potential impacts on the Ecological Status of the Manorway Fleet would likely be a result of construction activities which have the potential to release sediments / contaminants which could impact upon aquatic ecology.
- 9.5.11 These construction activities may include:

- Operation of construction plant / construction equipment within or adjacent to the Manorway Fleet;
- Contaminant leaks / spills from construction plant / construction equipment;
- Excavation within the Manorway Fleet or on the banks of the Manorway Fleet; and,
- Removal of vegetation from the channel margins.

#### Operation

9.5.12 No potential impacts on the Ecological Status of the Manorway Fleet are anticipated.

Suggested Mitigation / Monitoring Measures

#### Construction

- 9.5.13 Specific mitigation / monitoring measures to be incorporated include:
  - The implementation of a CEMP and Best Practice Construction Methods;
  - The storage of any fuels in line with agreements from the relevant Authorities (i.e. the use of double skinned / bonded storage areas; re-fuelling in a designated area of hard standing; availability of spill / leak kits);
  - The undertaking of any construction activities / works within 9 m of the bank top of the Manorway Fleet in accordance with a Land Drainage Consent (which will be supported by detailed Construction Method Statements); and,
  - The design of construction activities to reduce erosion / interaction with the Manorway Fleet / banks of the Manorway Fleet / channel margins.

#### Operation

9.5.14 No specific mitigation / monitoring measures are considered necessary.

#### **Conclusions**

- 9.5.15 It is considered unlikely that the construction / operation of the HV Electrical Connection would have an impact on the WFD Status of the Manorway Fleet.
- 9.5.16 It is also considered unlikely that the construction / operation of the HV Electrical Connection would have an impact on the ability of the Manorway Fleet to meet the Target Ecological Status for 2015.

#### 9.6 Assessment of Flood Risk

#### Requirement for a Full Flood Risk Assessment

- 9.6.1 The Thurrock Core Strategy 2011 has identified London Gateway (in which part of the HV Electrical Connection is located) as one of five Key Areas of Regeneration and Growth.
- 9.6.2 Therefore, although the route of the HV Electrical Connection passes through a Flood Zone 3, the location, size and nature of the HV Electrical Connection indicates that a full Flood Risk Assessment (incorporating sequential and exception testing) is not required.
- 9.6.3 In particular:
  - The majority of the HV Electrical Connection comprises an underground and culverted 400 kV cable system which will be buried along the majority of its length;

- The extension to the National Grid Coryton South Substation has been shown to be in an area which is not at risk from flooding; and,
- The Environmental Statement 2011 for the Underground Gas Pipeline and Associated AGI was considered by Thurrock Thames Gateway Development Corporation, and the Environment Agency advised that only a Flood Evacuation Plan should be prepared for construction personnel.
- 9.6.4 Accordingly, and in line with the consultation with the Environment Agency, this assessment of flood risk is of limited scope and contains:
  - A review of available flood risk information;
  - A description of the flood risk (along the route of the HV Electrical Connection and at the National Grid Coryton South Substation site); and,
  - Suggested mitigation / monitoring measures.

#### Review of Available Flood Risk Information

9.6.5 A comprehensive Flood Risk Assessment and Supplementary Flood Risk Assessment were completed in 2010 to support the application for Section 36 Consent for GEC. Flood Risk was also addressed in the Environmental Statement 2011 which was prepared to support the application for Planning Permission for the Underground Gas Pipeline and Associated AGI. These documents are available to download at:

http://www.gatewayenergycentre.co.uk/

- 9.6.6 These assessments considered all potential sources of flooding, including: tidal; fluvial; and, surface water (pluvial). The findings of the assessments showed that the risk of flooding within this flood zone is attributed to tidal flooding from the Thames Estuary, and there is no risk of flooding from fluvial sources (such as from the Manorway Fleet) or pluvial sources.
- 9.6.7 The Supplementary Flood Risk Assessment also included detailed modelling of various flood defence breach scenarios and the development of flood hazard maps. These breach scenarios and flood hazard maps also incorporated the route of the HV Electrical Connection.
- 9.6.8 The 'current' (i.e. showing no development taking place) breach scenario and flood hazard maps during a 1 in 200 year flood event are reproduced in Insert 9.1 and Insert 9.2 (Figure 1 and Figure 2 of the Supplementary Flood Risk Assessment from 2010). These Inserts illustrate a distinction between the potential flood risk along the HV Electrical Connection route (i.e. the underground and culverted 400 kV cable system) and the location of the National Grid Coryton South Substation. This is discussed further below.







Askimum Flood Depth [m]

NEV

< 0.05

050

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INSERT 9.2: FLOOD HAZARD RATING 0.5% PROBABIILTY (2050) EXISTING SITE LAYOUT





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#### Description of Flood Risk

Flood Risk along Route of HV Electrical Connection

- 9.6.9 The following assessment (and associated discussion) is applicable to the Preferred Option and Manorway Fleet / Northern Triangle Option.
- 9.6.10 Insert 9.1 and Insert 9.2 indicate that in the event of a defence failure the majority of the route of the HV Electrical Connection (i.e. the underground and culverted 400 kV cable system under the Preferred Option or the Manorway Fleet / Northern Triangle Option) would be flooded to a depth of 0.25 to 0.75 m. This translates to a Significant Flood Hazard Rating.
- 9.6.11 However, it is anticipated that there would be negligible impacts to the route of the HV Electrical Connection due to flood risk. In addition, the route of the HV Electrical Connection will have no effect on adjacent flood levels.

#### 9.6.12 This is because:

- The route of the HV Electrical Connection is within an area which is known to be well protected by existing flood defences.
- During construction, whilst there is a potential risk to construction personnel, this potential risk is the same as that posed to any members of the public using the A1014 (The Manorway) (and adjacent roads) or any other workers within the area.
- During construction, all Construction Contractors will be briefed on the potential risk, and Construction Method Statements will be prepared to ensure that any equipment used will not cause additional risk in the event of a flood event (i.e. care will be taken to ensure that construction machinery or equipment cannot float away and cause additional risks).
- Following construction, reinstatement will be undertaken which will result in minimal changes to the existing surface water processes or drainage requirements.
- During operation, any flood event will not impact on the route of the HV Electrical Connection.
- During operation, the route of the HV Electrical Connection would be buried along the majority of its length and therefore there will be no associated surface expression. As such, the route of the HV Electrical Connection will not result in the displacement of flood water that could increase the risk of flooding in other areas.
- During operation, if the area is flooded there will be no personnel on site. It should be noted that the route of HV Electrical Connection may be subject to infrequent maintenance visits. However, if there is the potential for a significant flood event (as warned by the EA) maintenance visits will not be undertaken.

Flood Risk at the National Grid Coryton South Substation Site

- 9.6.13 Insert 9.1 and Insert 9.2 indicate that in the event of a defence failure the site of the proposed extension to the National Grid Coryton South Substation is not at risk of flooding due to its location on higher ground.
- 9.6.14 Accordingly, there will be no impacts to the extension of the National Grid Coryton South Substation due to flood risk. In addition, the extension of the National Grid Coryton South Substation will have no effect on adjacent flood levels.

#### Suggested Mitigation / Monitoring Measures

Mitigation / Monitoring Measures along Route of HV Electrical Connection

- 9.6.15 No specific mitigation / monitoring measures are considered necessary.
- 9.6.16 In addition:
  - Based on the likelihood that there will be no change in the existing surface water processes or drainage requirements and no associated surface expression, no changes to the existing highways drainage network are considered necessary.
  - Detailed Flood Evacuation Plans for GEC have been put in place in response to the findings of the breach modelling of the assessments, and these Flood Evacuation Plans are considered adequate to ensure the safe evacuation of construction personnel in the event of a breach.

Mitigation / Monitoring Measures at the National Grid Coryton South Substation Site

9.6.17 No specific mitigation / monitoring measures are considered necessary.

#### 9.7 Land Contamination

- 9.7.1 The following assessment (and associated discussion) is applicable to the Preferred Option and Manorway Fleet / Northern Triangle Option.
- 9.7.2 Land contamination in the area has been extensively studied as part of the applications for GEC and the Underground Gas Pipeline and Associated AGI. Based on the results of these studies it is concluded that:
  - During construction, in terms of land contamination, contaminants (such as fuels and concrete) likely to be used will have a negligible impact on the surrounding environment. Indeed, any potential impacts will be managed and controlled through the implementation of a CEMP / the use of Best Practice Construction Methods. In addition, procedures will be put in place to deal with any contaminant leaks / spills.
  - During construction, in terms of land contamination, existing soil conditions are anticipated to have a negligible impact on site workers. Indeed, if contamination hot spots are encountered, any potential impacts to construction personnel (arising from oral / dermal contact) will be negated by an appropriate remediation method and the implementation of a CEMP / the use of Best Practice Construction Methods.
  - During operation, in terms of land contamination, no potentially hazardous substances will be stored and used. Therefore there are no impacts on site workers or the surrounding environment.

#### 9.8 Additional Considerations

- 9.8.1 Under the Preferred Option and the Manorway Fleet / Northern Triangle Option, construction activities / works will likely be undertaken within 9 m of the bank top of the Manorway Fleet.
- 9.8.2 As such, an application for Land Drainage Consent will need be made to the Environment Agency. This application to the Environment Agency will be made subsequent to the application for Planning Permission, once the detailed design once the Construction Contractor / HDD Specialist has been appointed, final agreements with Land Owners have been obtained and the locations of the HDD drilling pits have been confirmed.
- 9.8.3 The application for Land Drainage Consent will be accompanied by detailed design drawings, and will be supported by detailed Construction Method Statements



(including appropriate mitigation measures) which would be intended to support this Water Resources Assessment.

#### 10 INDIRECT / SECONDARY AND CUMULATIVE IMPACTS

#### 10.1 Introduction

- 10.1.1 A high level assessment of the indirect / secondary and cumulative impacts associated with the development of the HV Electrical Connection has been undertaken.
- 10.1.2 Indirect / secondary impacts are impacts on the environment which are not a direct consequence of a proposed development, and are often produced far away from the site of a proposed development (e.g. when they are a consequence of an ancillary activity rather than a main development activity).
- 10.1.3 Cumulative impacts can be either:
  - <u>Type 1 Cumulative Impacts;</u> or

These are combined effects of different types of impact on a single receptor. For example: noise, dust and visual impacts resulting from construction and operation of the development and other planned developments.

• Type 2 Cumulative Impacts.

These are impacts from other planned developments (considered together with the proposed development) which individually may be insignificant, but when considered together could form a significant cumulative impact. For example: combined traffic impacts from two or more proposed developments.

10.1.4 It should be noted that there is an inherent uncertainty in the range of cumulative impacts which may arise. Therefore this high level assessment has sought to identify the likely significant effects in a qualitative manner.

#### 10.2 Description of Developments Considered

- 10.2.1 In addition to the HV Electrical Connection, the developments considered are:
  - GEC;
  - The new underground gas pipeline and associated AGI;
  - Potential CHP connections associated with the development of GEC; and,
  - The LG Development.
- 10.2.2 It should be noted that the preferred routes of the infrastructure connections (underground gas pipeline and associated AGI / CHP connections) are still to be confirmed. However, information relating to the likely significant environmental impacts is presented.

#### GEC

- 10.2.3 Information on GEC is provided in the ES 2010 and the ES FID 2010.
- 10.2.4 These documents are available to download at:

http://www.gatewayenergycentre.co.uk/

Underground Gas Pipeline and Associated AGI

- 10.2.5 Information on the underground gas pipeline and associated AGI is provided in the ES 2011 and the ES FID 2011.
- 10.2.6 These documents are available to download at:

http://www.gatewayenergycentre.co.uk/

#### **CHP Infrastructure Connections**

10.2.7 Details on the CHP opportunities are presented in the CHP Assessment and the Supplementary CHP Assessment. These documents are available to download at:

http://www.gatewayenergycentre.co.uk/

- 10.2.8 The results of the two assessments are that the provision of CHP from a CCGT power plant specifically designed for such a purpose would be technically feasible.
- 10.2.9 Therefore, GEC may also require the installation of on site and off site CHP plant / CHP infrastructure.
- 10.2.10 The installation and operation of the on site CHP plant / CHP infrastructure could take place as part of the construction of GEC, and therefore assessment of the potential impacts is covered by the ES 2010.
- 10.2.11 The installation of off site CHP plant / CHP infrastructure may fall to the CHP user, and are considered similar to the impacts of installing / upgrading utility services. These types of installation works are not considered to have the potential for significant environmental effects within the LG Development, and therefore the off site CHP infrastructure works are excluded from this Section.
- 10.2.12 Therefore, the CHP infrastructure connections are not considered further here.

#### The LG Development<sup>15</sup>

- 10.2.13 GEC will be located on land within the LG Development.
- 10.2.14 The LG Development comprises a deep-sea global container shipping port (LG Port) and a logistics and commercial centre (LG Logistics and Business Park). These are currently being developed on the site of the former Shell Oil Refinery at Shell Haven near Corringham and Stanford-le-Hope (Essex) on the northern banks of the Thames Estuary.
- 10.2.15 The LG Port involves the provision of up to seven deep-sea shipping berths and associated container handling facilities with a quayside approximately 2.7 km in length. Once fully developed, the LG Port will have an annual capacity of approximately three and a half million Twenty-foot Equivalent Shipping Container Units.
- 10.2.16 Associated with the LG Port is: the dredging of higher parts of the River Thames navigation channel to provide for the passage of container vessels; the twin tracking of the Thames Haven branch railway line to provide rail freight connectivity via the wider rail network; and, the provision of highway access facilities providing connection to the strategic highway network via the adjacent A1014 (The Manorway) and the A13.
- 10.2.17 The LG Logistics and Business Park is located directly to the north of the LG Port and comprises the provision of up to approximately 938 000 square metres of commercial floor space and associated site infrastructure (including an internal highway network, drainage and landscaping). The commercial buildings to be situated within the LG Logistics and Business Park are expected to have footprints up to 120 000 square metres.
- 10.2.18 The commercial buildings / developments to the eastern and southern perimeter of the LG Logistics and Business Park will benefit from direct access to the rail network via the Thames Haven Branch Line or common user rail sidings. In addition, as with the LG Port, the LG Logistics and Business Park benefits from the provision of

<sup>&</sup>lt;sup>15</sup> The majority of this discussion is taken from 'London Gateway Access Road Environmental Statement' (June 2010) – Section 1 (Introduction)

highway access facilities providing connection to the strategic highway network via the adjacent A1014 (The Manorway) and the A13.

The LG Development Planning History

- 10.2.19 The nature of the LG Development is such that a wide variety of Consent applications were required. The initial con-current applications associated with the LG Port, LG Logistics and Business Park, and Associated Works included applications for:
  - A Harbour Empowerment Order (HEO) under the Harbours Act 1964 associated with the proposed Port;
  - An Outline Planning Application (OPA) under the Town and Country Planning Act 1990 for the proposed LG Logistics and Business Park; and,
  - A Transport and Works Act Order (TWAO) under the Transport and Works Act 1992 for rail infrastructure associated with the LG Logistics and Business Park development.
- 10.2.20 The above applications, all of which were accompanied by respective ESs, were approved on 30 May 2007. The TWAO was made on 7 September 2007 and came into force on 28 September 2007. The HEO was made on 2 May 2008 and came into force on 16 May 2008.
- 10.2.21 The applications (and their subsequent approvals) were informed by the following ESs:
  - The HEO Environmental Statement (2002), which considered the likely significant environmental effects associated with the development of the LG Port and associated facilities;
  - The OPA Environmental Statement (2002), which considered the likely significant environmental effects associated with the LG Logistics and Business Park and associated facilities;
  - The TWAO Environmental Statement (2002), which considered the likely significant environmental effects associated with the development of the proposed rail improvements; and
  - The Consolidated Environmental Statement (2004), which considered the likely significant cumulative environmental effects associated with all three developments.
- 10.2.22 Further to the above, an additional ES has been prepared and submitted as part of an application for Planning Permission (PP) for the proposed 'Refined Access Road Arrangement' under the Town and Country Planning Act 1990. This is referred to as the PP Environmental Statement (June 2010).
- 10.2.23 As a result, a substantial proportion of the existing environment at the GEC site (located on land within the south east corner of the LG Development) and surrounding area is already well understood and the baseline conditions are already established.
- 10.2.24 A visualisation of the potential appearance and scale of the completed LG Development, including GEC, is available to view on:

http://www.londongateway.com/portal/page/portal/LONDON\_GATEWAY/Home

#### 10.3 High Level Indirect / Secondary Impact Assessment

10.3.1 The following Subsection identifies the likely indirect / secondary impacts during the construction and operation of GEC and the underground gas pipeline and associated AGI.
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10.3.2 It should be noted that indirect / secondary impacts have been considered on the basis that GEC would not operate without a gas connection and electrical connection. However, it could be more properly said that the gas connection (proposed gas pipeline and associated AGI) and electrical connections are indirect / secondary impacts of the development of GEC.

Indirect / Secondary Impacts during Construction

<u>GEC</u>

10.3.3 Table 10.1 summarises the likely impacts of GEC during construction.

Underground Gas Pipeline and Associated AGI

10.3.4 Table 10.2 summarises the likely impacts of the underground gas pipeline and associated AGI during construction.

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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Air Quality	During construction, there is the potential for dust emissions to arise	Dust impacts will be managed and controlled through a CEMP.	The residual impact is assessed as not significant.	CEMP.
Noise	Noise generating plant will be used during the construction phase.	Construction plant and activities will be managed and controlled through a CEMP.	The residual impact is assessed as not significant.	CEMP.
Landscape and Visual	It is unlikely that there will be any impacts on the landscape character. It is likely that visual impacts will occur.	Construction works will be screened by hoarding, where practical, to mitigate landscape and visual impacts near to sensitive receptors.	Although mitigation measures will reduce potential visual impacts, it is likely that significant adverse impacts will arise during the construction phase. These impacts will be temporary in nature, and as such the residual impact is assessed as not significant.	CEMP.
Ecology	Due to the nature of site, and the program of clearance and translocation undertaken, there is limited potential for impacts on ecological receptors.	A program of clearance and translocation has been undertaken. Habitat surveys (and, if required, protected species surveys) will be undertaken prior to construction works commencing on site. Measures to introduce biodiversity enhancements on and off site will be identified.	The residual impact is assessed as not significant.	Clearance and translocation has taken place as part of the LG Development / CEMP.
Water Quality	There is the potential for impacts on controlled waters to arise.	This impact will be managed and controlled through a CEMP and drainage strategy.	The residual impact is assessed as not significant.	CEMP.

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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Geology and Land Contamination	Due to the location of the site, and the historical land uses, there is a high potential for contamination to be present on site. Contaminants (such as fuels and concrete) will be used on site. There is the potential for land contamination to occur as a result of spillages.	A full program of remediation will be undertaken prior to the commencement of construction. A risk assessment will be carried out prior to the commencement of construction. This will be managed and controlled through a CEMP. Procedures will be put in place to deal with any pollution spills.	The residual impact is assessed as not significant.	Remediation to take place as part of the LG Development / CEMP.
Traffic	There may be additional construction traffic in the form of HGVs and construction personnel vehicles.	Traffic will be managed and controlled through a Construction Transport Management Plan (CTMP).	The residual impact is assessed as not significant.	CEMP / CTMP.
Cultural Heritage	The cultural heritage in the area is well understood from the work undertaken for the LG Development. As such, the existence and whereabouts of any existing cultural heritage features which have the potential to be impacted upon are already well understood. It is unlikely that there will be any archaeological remains of significance.	An assessment of the likelihood of archaeological remains of significance on the proposed site will be undertaken and prior to construction, a plan of archaeological works will be developed in conjunction with the Essex County Archaeological works will be archaeological remains are present, an archaeological watching brief will be used during construction.	The residual impact is assessed as not significant.	CEMP.

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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Socio-Economics	Short term employment opportunities during the construction works.	The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	Residual positive impact, albeit short term.	None Required.
Safety	There are a number of safety considerations which need to be implemented such that GEC can be designed, built and tested (i.e. constructed) in such a way that its integrity is not comprised during its operational lifetime.	GEC will be designed and constructed in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.	The residual impact is assessed as not significant.	Compliance with relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.
Health	During construction, there may be the potential for impacts on health due to air / dust emissions, noise and transport.	The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a Health Management Plan (HMP).	The residual impact is assessed as not significant.	CEMP (for other aspects of the environment listed above) / HMP.

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TABLE 10.2: LIKELY IMPACTS OF THE CONSTRUCTION OF THE UNDERGROUND GAS PIPELINE AND ASSOCIATED AGI

Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Air Quality	During construction, there is the potential for dust emissions to arise	Dust impacts will be managed and controlled through a CEMP.	The residual impact is assessed as not significant.	CEMP.
Noise	Noise generating plant will be used during the construction phase.	Construction plant and activities will be managed and controlled through a CEMP.	The residual impact is assessed as not significant.	CEMP.
Landscape and Visual	It is likely that there will be impacts on the landscape character. It is likely that visual impacts will occur.	Construction works will be screened by hoarding, where practical, to mitigate landscape and visual impacts near to sensitive receptors.	Although mitigation measures will reduce potential visual impacts, it is likely that significant adverse impacts will arise during the construction phase. These impacts will be temporary in nature, and as such the residual impact is assessed as not significant.	CEMP.
Ecology	There is the potential for impacts on ecology to arise during the construction phase.	Habitat surveys and protected species surveys will be undertaken prior to construction works commencing on site. Areas where protected species are known to occur or areas with the potential to support ecological habitat will be avoided where possible, and removal of habitat will not occur during the breeding season.	The residual impact is assessed as not significant.	CEMP.

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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Water Quality	There is the potential for impacts on controlled waters to arise.	This impact will be managed and controlled through a CEMP and drainage strategy. No untreated water will be allowed to drain to controlled waters. Any water crossings will be designed to reduce impacts on water bodies.	The residual impact is assessed as not significant.	CEMP.
Geology and Land Contamination	Contaminants (such as fuels and concrete) will be used on site. There is the potential for land contamination to occur as a result of spillages.	This will be managed and controlled through a CEMP. Procedures will be put in place to deal with any pollution spills / hotspots encountered.	The residual impact is assessed as not significant.	CEMP.
Traffic	There may be additional construction traffic in the form of HGVs and construction personnel vehicles.	Traffic will be managed and controlled through a CTMP.	The residual impact is assessed as not significant.	CEMP / CTMP.
Cultural Heritage	The cultural heritage in the area is well understood from the work undertaken for GEC and the LG Development / undertaking of agricultural activities. There is a potential for the setting of cultural heritage features (i.e. Listed Buildings) to be subject to landscape and visual impacts. There is also a potential for unknown cultural heritage features to be impacted upon.	Depending on the understanding of the cultural heritage potential, a range of mitigation measures can be implemented. These range from using a targeted Archaeological Watching Brief to alteration of the construction technique.	The residual impact is assessed as minor adverse / not significant depending on whether any unknown cultural heritage features are encountered.	CEMP.

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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Socio-Economics	Short term employment opportunities during the construction works.	The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	Residual positive impact, albeit short term.	None Required.
Safety	There are a number of safety considerations which need to be implemented such that gas connection can be designed, built and tested (i.e. constructed) in such a way that its integrity is not comprised during its operational lifetime.	The gas connection will be designed and constructed in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.	The residual impact is assessed as not significant.	Compliance with relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.
Health	During construction, there may be the potential for impacts on health due to air / dust emissions, noise and transport.	The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a HMP.	The residual impact is assessed as not significant.	CEMP (for other aspects of the environment listed above) / HMP.

### Indirect / Secondary Impacts during Operation

GEC

- 10.3.5 It is expected that the main impacts during operation of GEC will be associated with: air quality; noise and vibration; and, landscape and visual.
- 10.3.6 Furthermore, it is expected that during operation of GEC there will be no / negligible impacts on: ecology; water quality; geology and land contamination; traffic; cultural heritage; or, socio-economics.
- 10.3.7 Table 10.3 summarises the likely impacts of GEC during operation.

Underground Gas Pipeline and Associated AGI

- 10.3.8 It is expected that the main impacts during operation of the underground gas pipeline and associated AGI will be associated with: noise and vibration; landscape and visual; and, land use.
- 10.3.9 Furthermore, it is expected that during operation of the underground gas pipeline and associated AGI there will be no / negligible impacts on: air quality; ecology; water quality; geology and land contamination; cultural heritage; and, socio-economics.
- 10.3.10 Additionally, impacts associated with traffic are not considered significant, and therefore no mitigation is proposed. This is due to the following reason:
  - Traffic will be limited to infrequent maintenance checks and emergency situations. Due to the infrequent nature of these trips, this is not considered to present an impact.
- 10.3.11 Table 10.4 summarises the likely impacts of the underground gas pipeline and associated AGI during operation.

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# TABLE 10.3: LIKELY IMPACTS OF THE OPERATION OF GEC

	Operation Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
	Emissions of nitrogen oxides (NO <sub>x</sub> ).	GEC will be equipped with proven pollution control technology, which will limit the production of NO <sub>x</sub> to a level below that required by the LCPD.	The residual impact is assessed as not significant.	By Design / Condition of Consent / Permit.
	There may be continuous low level noise from GEC.	GEC will feature integral acoustic enclosures designed to ensure that noise levels generated are within the acceptable limits.	The residual impact is assessed as not significant.	By Design / Condition of Consent / Permit.
a	It is unlikely that there will be any impacts on the landscape character. It is likely that visual impacts will occur.	GEC will be situated on land within the LG Development. Materials and finishes will be selected to minimise maintenance requirements, and be sympathetic to the appearance of the surrounding LG Development.	Due to the likely use of the surrounding land, the likely appearance of GEC and the screening afforded by the LG Development, the residual impact is assessed as not significant.	By Design.
	There are a number of safety considerations which need to be implemented such that GEC can be operated in such a way that its integrity is not comprised during its operational lifetime.	GEC will be operated in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.	The residual impact is assessed as not significant.	Compliance with relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.

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	Impact Type	<b>Operation Impacts</b>	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
	Health	During operation, there may be the potential for impacts on health.	The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required.	The residual impact is assessed as not significant.	HMP.
			However, applicable mitigation measures may be drawn together in a HMP.		

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TABLE 10.4: LIKELY IMPACTS OF THE OPERATION OF THE UNDERGROUND GAS PIPELINE AND ASSOCIATED AGI

	Operation Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
	There is the potential for low level noise associated with the AGI.	High specification, low noise plant will be specified during the design phase. Regular maintenance checks will be carried out to ensure plant is working efficiently. Broken or faulty plant will be replaced.	The residual impact is assessed as not significant.	Condition of Consent.
l Visual	It is likely that there will be landscape and visual impacts associated with the AGI.	The landscape and visual impact of the off take AGI will be screened by planting to reduce visual impacts.	Due to the fact that the impact will reduce over time as the screening becomes more effective, the residual impact is assessed as not significant.	Condition of Consent.
	Permanent occupation of agricultural land by AGI.	The landowner will be compensated by financial means for the permanent occupation of land. Productive agricultural land required will be minimised.	The gas pipeline will be buried for its length. Therefore the residual impact is assessed as not significant. In terms of the occupation of land for the AGI, the residual impact is assessed as not significant.	Condition of Consent.
	There are a number of safety considerations which need to be implemented such that the gas connection can be operated in such a way that its integrity is not comprised during its operational lifetime.	The gas connection will be operated in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.	The residual impact is assessed as not significant.	Compliance with relevant Codes of Practice, Standards, Recommendations and Statutory Legislation.

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Health	Impact Type
During operation, there may be the potential for impacts on health.	<b>Operation Impacts</b>
The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a HMP.	Mitigation
The residual impact is assessed as not significant.	Residual Effects
HMP.	Means by which Mitigation will be Delivered

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- 10.4 Introduction to High Level Cumulative Impact Assessment
- 10.4.1 The following Subsections identify the main likely cumulative impacts during the construction and operation of GEC, the underground gas pipeline and associated AGI, and the LG Development.

### Construction

<u>GEC</u>

10.4.2 Table 10.1 summarises the likely impacts of GEC during construction.

Underground Gas Pipeline and Associated AGI

10.4.3 Table 10.2 summarises the likely impacts of the underground gas pipeline and associated AGI during construction.

### LG Development

10.4.4 Table 10.5 summarises the likely impacts of the LG Development during construction. *Operation* 

GEC

- 10.4.5 Table 10.3 summarises the likely impacts of GEC during operation.
  - Underground Gas Pipeline and Associated AGI
- 10.4.6 Table 10.4 summarises the likely impacts of the underground gas pipeline and associated AGI during operation.

LG Development

10.4.7 Table 10.6 summarises the likely impacts of the LG Development during operation.

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Impact Type	<b>Construction Impacts</b>	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Air Quality	During construction, there is the potential for dust emissions to arise.	Outline Planning Application (OPA) Conditions <sup>16</sup> 67 (wheel cleansing), 69 (management of dust) and 76 (CEMP). A Framework Construction Management Strategy (FCMS), which includes provisions for air quality mitigation during the construction period, has been submitted and approved by the Local Planning Authority in consultation with relevant stakeholders. All contractors employed at the LG Development will be required to submit detailed	Following implementation of the mitigation, LG Development ES states that there will be no residual impact.	OPA Conditions / Construction Management Strategy.
		proposals which comply with		

the FCMS.

# TABLE 10.5: LIKELY IMPACTS OF THE CONSTRUCTION OF THE LG DEVELOPMENT

<sup>&</sup>lt;sup>16</sup> These reference the OPA Conditions for the LG Logistics and Business Park. It should be noted that similar provisions exist in the HEO Conditions for the LG Port, and therefore the OPA Conditions are considered to reflect the general required conditions over the LG Development.

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:t Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
and Vibration	Noise generating plant will be used during the construction phase. LG Development ES states that there will be changes to the baseline noise levels at a number of identified receptors.	OPA Conditions 68 (control of noise) and 76 (CEMP). A Framework Construction Management Strategy (FCMS), which includes provisions for noise mitigation during the construction period, has been submitted and approved by the Local Planning Authority in consultation with relevant stateholders. All contractors employed at the LG Development will be required to submit detailed proposals which comply with the FCMS.	Following implementation of the mitigation, LG Development ES states that the residual impact will range between none (night time) and moderate adverse (day time).	OPA Conditions / Construction Management Strategy.

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Landscape and Visual	Impact Type
Landscape and visual impacts associated with the construction of the LG Development.	<b>Construction Impacts</b>
Aside from the measures discussed in the LG Development ES, DP World – London Gateway are not required to provide any construction mitigation.	Mitigation
The LG Development ES states that the residual impacts will vary depending on development and receptor. The findings are summarised here: LG Logistics and Business <u>Park</u> • Landscape Impacts – Negligible / None to Moderate Adverse evisual Impacts – Negligible / None to Major Adverse • Visual Impacts – Negligible / None to Major Adverse • Landscape Impacts – Negligible / None to Major Adverse • Visual Impacts – Negligible / None to Major Adverse • Visual Impacts – Negligible / None to Major Adverse • Visual Impacts – Negligible / None to Major	Residual Effects
Mitigation only as described in LG Development ES <sup>17</sup> .	Means by which Mitigation will be Delivered

<sup>17</sup> OPA Environmental Statement<sup>\*</sup> (Complied Version 2004)

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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Ecology	Despite the nature of the site, and the program of clearance and translocation undertaken, there is potential for impacts on ecological receptors.	OPA Conditions 73 (Ecological Management and Mitigation Plans), 74 (Ecological Action Plans), 75 (Ecological Advisory Group) and 76 (CEMP). Habitat surveys (and, if required, protected species surveys) have been undertaken prior to construction works commencing on site. Measures to introduce biodiversity enhancements on and off site have been identified. Ecology clearance and translocation of species has been undertaken under translocation of species has been undertaken under 1994 (as amended) (now the Conservation flabitats and Species Regulations 1994 (as amended) (now the Conservation Plans for the LG Port and Logistics and Business Park detail the proposed mitigation as a result of the LG Port HEO.	Following implementation of the mitigation, LG Development ES <sup>18</sup> states that the residual impact will vary for individual ecological receptors, including: Plants – Negligible Badger – Negligible Bats – Minor Adverse Brown Hare – Minor Adverse Water Vole – Negligible to Moderate Adverse Birds – Minor Adverse Invertebrates – Negligible Reptiles / Amphibians – Minor Adverse	OPA Conditions

<sup>&</sup>lt;sup>18</sup> 'OPA Environmental Statement' (Complied Version 2004)

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Impact Type	Construction Impacts	Mitigation	Residual Effects
		OPA Conditions 29 (temporary drainage scheme), 30 (monitoring of outfalls) and 76 (CEMP).	
		A Framework Construction Management Strategy (FCMS), which includes	
	There is the notential for	provisions for drainage and water quality mitigation during	Following implementation of the mitigation I G
Water Quality	impacts on controlled waters	the construction period, has	Development ES <sup>19</sup> states that
	to arise.	been submitted and approved	the residual impacts may be
		Authority in consultation with relevant stakeholders.	
		All contractors employed at the LG Development will be	
		proposals which comply with the FCMS.	

<sup>&</sup>lt;sup>19</sup> :OPA Environmental Statement<sup>\*</sup> (Complied Version 2004)

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Means by which Mitigation will be Delivered	tion of ates that vill be: nd drift drift sidual Strategy. ial for nce; \$ to es that for use
Residual Effects	<ul> <li>Following implemental the mitigation, LG</li> <li>Development ES<sup>20</sup> state the residual impacts w</li> <li>None – on solid an geology;</li> <li>Minor Beneficial du the reduction in rescontamination and reduction in potent unexploded ordnar and</li> <li>Minor Adverse due generation of wast cannot be treated for an site.</li> </ul>
Mitigation	OPA Conditions 83 (earthworks), 84 (testing of imported materials), 89 (ground condition assessment and remediation scheme), 90 (stripping and storage of topsoil) and 76 (CEMP). A Framework Construction Management Strategy (FCMS), which includes provisions for ground contamination mitigation during the construction period, has been submitted and approved by the Local Planning Authority in consultation with relevant stakeholders. All contractors employed at the LG Development will be required to submit detailed proposals which comply with the FCMS.
Construction Impacts	Due to the location of the LG Development site, and the historical land uses, there is a high potential for contamination to be present on site. Contaminants (such as fuels and concrete) will be used on site. There is the potential for land contamination to occur as a result of spillages.
Impact Type	Geology and Land Contamination

<sup>&</sup>lt;sup>20</sup> 'OPA Environmental Statement' (Complied Version 2004)

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Impact Type	Construction Impacts	Mitigation	Residual Effects	Means by which Mitigation will be Delivered
Traffic	There may be additional construction traffic in the form of HGVs and construction personnel vehicles.	OPA Conditions 63 (parking management scheme), 61 (notification of preferred routes), 62 (preferred routes) and 76 (CEMP). A Framework Construction Management Strategy (FCMS), which includes provisions construction traffic mitigation, has been submitted and approved by the Local Planning Authority in consultation with relevant stakeholders. All contractors employed at the LG Development will be required to submit detailed proposals which comply with the FCMS.	Due to the low levels of construction traffic expected, the residual impact is assessed as not significant.	OPA Conditions / Construction Management Strategy.
Cultural Heritage	Due to the nature of the site, and its historical uses, there is potential for impacts on cultural heritage and archaeology.	OPA Conditions 91 (programme of archaeological work), 92 (archaeological method statement) and 76 (CEMP).	Following implementation of the mitigation, LG Development ES states that the residual impact will vary between none and minor adverse.	OPA Conditions
Socio-Economics	Short term employment opportunities during the construction works.	The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	Residual positive impact, albeit short term.	None Required.

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TABLE 10.6: LIKELY IMPACTS OF THE LG DEVELOPMENT OPERATION

eans by which Mitigation 'Il be Delivered	A Conditions.	A Conditions.
Residual Effects M	<ul> <li>Following implementation of the mitigation, LG</li> <li>Development ES states:</li> <li>No residual impacts to local air quality</li> <li>Moderate adverse impacts due to greenhouse gas effects</li> </ul>	Following implementation of the mitigation, LG Development ES states the post mitigation residual impacts are an increase in the baseline noise levels. A summary of the residual impacts with and without the development of the proposed rail improvements associated with the LG Logistics and Business Park are: 0 Impacts due to daytime operational traffic – not significant Impacts due to daytime industrial activities – not significant Impacts due to night time operational traffic – industrial activities – minor adverse
Mitigation	OPA Conditions 57. 58 and 59.	OPA Conditions 51, 54, 55, 70 and 71 all deal with requirements for acoustic barriers. OPA Condition 56 requires low noise surfacing on The Manorway (A1014). OPA Condition 72 restricts the placing of plant machinery on walls or roofs of buildings without prior approval.
Operation Impacts	LG Development ES states there may be local air quality effects and greenhouse gas effects associated with the operation of the LG Development.	LG Development ES states there may be traffic and industrial noise associated with the operation of the LG Development which will increase the baseline noise levels.
Impact Type	Air Quality	Noise and Vibration

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Landscape and Visual	Impact Type 0
andscape and visual npacts associated with the perational LG Development.	peration Impacts
The LG Development has been designed to minimize any landscape and visual impacts. OPA Conditions 77 (strategic landscaping), 78 (landscape scheme), 79 (landscape management plan), 80 (hard and soft landscape works), 82 (dead or damaged trees) and 83 (earthworks). OPA Condition 72 restricts the placing of plant machinery on walls or roofs of buildings without prior approval.	Mitigation
<ul> <li>Following implementation of the mitigation, LG</li> <li>Development ES states that the residual impacts will vary depending on development and receptor.</li> <li>The findings are summarised here:</li> <li>LG Logistics and Business Park</li> <li>Landscape Impacts - Minor Adverse</li> <li>Visual Impacts - Minor Benefit to Moderate Benefit to Minor Adverse</li> <li>Landscape Impacts - Minor Adverse</li> <li>Landscape Impacts - Minor Adverse</li> <li>Landscape Impacts - Minor Adverse</li> <li>Visual Impacts - Minor Adverse</li> <li>Negligible / None to Minor Adverse</li> </ul>	Residual Effects
OPA Conditions.	Means by which Mitigation will be Delivered

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	Impact Type
There may be large traffic olumes and movement issociated with the operation of the LG Development. The potential for cumulative mpacts of this operational raffic with GEC will be letermined by the timing of he uptake of sites within the letermined by the timing of sociated of sites within the G Development. Construction traffic to the CEC will be small in comparison to the otal anticipated trip generation of the LG Development.	Operation Impacts
OPA Conditions and Obligations include: highway improvement schemes; Travel Plans; Travel Plan Committee; and, Section 106 contributions towards highway mitigation.	Mitigation
There will be no significant cumulative impact on the local road network as a result of GEC and the LG Development.	Residual Effects
OPA Conditions and Obligations.	Means by which Mitigation will be Delivered

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### 10.5 High Level Assessment of Type 1 Cumulative Impacts

10.5.1 Rather than undertaking a high level assessment of the potential for significant impacts on each possible receptor, groups of sensitive receptors have been chosen which are likely to be the most sensitive to Type 1 Cumulative Impacts. The criteria for identifying sensitive receptors has included: existing land uses; proximity to construction works; and, likely duration of exposure to impacts.

### Type 1 Cumulative Impacts during Construction

- 10.5.2 For the purposes of the high level assessment, and in order to ensure that likely significant effects are assessed, a worst case scenario has been assumed, namely that receptors will be subject to construction impacts throughout the duration of the construction works. However, it is likely that construction of the HV Electrical Connection (and also the new underground gas pipeline) would be in stages, and the construction activities would travel along the line of the route as sections are completed.
- 10.5.3 Table 10.7 presents the likely Type 1 Cumulative Impacts that may be felt during construction of the developments. However, there is the potential for some construction to occur at a later date. If this is the case the environmental impacts may continue for a longer time, but the cumulative impacts may be reduced.

Sensitive Receptor	2013	2014	2015	2016	2017
Nearby Residential Properties	D/N/V/T	D/N/V/T	D/N/V/T	D/N/V/T	Very minor impacts <sup>21</sup>
Adjacent Commercial Users	D / N / T	D / N / T	D / N / T	D / N / T	Very minor impacts <sup>22</sup>
Land Owners	D/N/L/T	D/N/L/T	D/N/L/T	D/N/L/T	No impacts
Protected Species	D / N	D / N	D / N	D / N	No impacts
Surface Water / Agricultural Drainage Systems	D/N/T	D/N/T	D/N/T	D/N/T	No impacts
Agricultural Land	D / N	D / N	D / N	D / N	No impacts
D – Temporary, local, adverse dust impacts					
N – Temporary, local, adverse noise and vibration impacts					
V – Tempora	V – Temporary, local, adverse visual impacts				
L – Tempora	ary loss of land				
T – Tempora	ary, local, advers	e traffic impacts	6		

# TABLE 10.7:LIKELY TYPE 1 CUMULATIVE IMPACT INTERACTIONS DURINGCONSTRUCTION OF THE DEVELOPMENTS

10.5.4 As shown in Table 10.7, the majority of the Type 1 Cumulative Impacts are likely to arise from construction activities which are likely to produce: dust; noise and vibration; landscape and visual impacts; and, traffic impacts.

<sup>&</sup>lt;sup>21</sup> Due to the ongoing construction of the LG Development.

<sup>&</sup>lt;sup>22</sup> Due to the ongoing construction of the LG Development.

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- 10.5.5 However, a Construction Environmental Management Plan (CEMP) will be implemented during the construction phase, which can be secured by an appropriate planning condition. Similar CEMPs will be put in place for GEC (under the Section 36 Consent) and the underground gas pipeline and associated AGI (under the Planning Permission), a mechanism will similarly be in place to minimise construction impacts 'at source' in order to reduce the likely impacts on surrounding receptors.
- 10.5.6 As a result, overall it is considered that any impact interactions occurring will generally be temporary and short term in nature. Furthermore these can be mitigated to a large extent by the control measures set out the appropriate CEMPs.
- 10.5.7 Therefore the likely Type 1 Cumulative Impacts predicted to occur during construction are likely to be not significant.

### Type 1 Cumulative Impacts during Operation

- 10.5.8 Similar to the approach used above, rather than undertaking an assessment of the potential for significant impacts on each possible receptor, groups of receptors have been chosen which are considered likely to be the most sensitive to Type 1 Cumulative Impacts. In addition, for the purposes of the assessment a worst case scenario has been assumed, namely that receptors will be subject to all operational impacts.
- 10.5.9 Table 10.8 presents the likely Type 1 Cumulative Impacts that may be felt during the operation of the developments.

## TABLE 10.8:LIKELY TYPE 1 CUMULATIVE IMPACT INTERACTIONS DURINGOPERATION OF THE DEVELOPMENTS

Sensitive Receptor	<b>Operational Lifetime of Developments</b>
Nearby Residential Properties	V/T
Adjacent Commercial Users	т
Land Owners	L
V – Visual impacts	
L – Permanent loss of land	
T – Traffic impacts	

- 10.5.10 Mitigation measures will reduce the likely Type 1 Cumulative Impacts during operation.
- 10.5.11 Therefore the likely Type 1 Cumulative Impacts predicted to occur during operation are largely assessed to be not significant.

### 10.6 High Level Assessment of Type 2 Cumulative Impacts

10.6.1 An initial screening exercise was undertaken to identify which aspects of the environment may be subject to Type 2 Cumulative Impacts as a result of the construction and operation of the developments.

### Type 2 Cumulative Impacts during Construction

- 10.6.2 Table 10.9 summarises the likely Type 2 Cumulative Impacts which could be encountered during construction.
- 10.6.3 In addition, Table 10.9 summarises the proposed mitigation and determines the significance of the likely Type 2 Cumulative Impacts.



### Type 2 Cumulative Impacts during Operation

- 10.6.4 Table 10.10 summarises the likely Type 2 Cumulative Impacts which could be encountered during operation.
- 10.6.5 In addition, Table 10.10 summarises the proposed mitigation and determines the significance of the likely Type 2 Cumulative Impacts.

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Noise and Vibration	Air Quality	Impact
Noise generating plant will be used during the construction phase. Construction plant and activities will be managed and controlled through a CEMP.	During construction, there is the potential for dust emissions to arise. Dust impacts will be managed and controlled through a CEMP.	Electrical Connection <sup>23</sup>
Noise generating plant will be used during the construction plant and activities will be managed and controlled through a CEMP.	During construction, there is the potential for dust emissions to arise. Dust impacts will be managed and controlled through a CEMP.	GEC (see Table 10.1)
Noise generating plant will be used during the construction phase. Construction plant and activities will be managed and controlled through a CEMP.	During construction, there is the potential for dust emissions to arise. Dust impacts will be managed and controlled through a CEMP.	Gas Connection (See Table 10.2)
Noise generating plant will be used during the construction phase / changes in baseline noise levels at a number of sensitive receptors. Mitigation included in OPA Conditions and Construction Management Strategy.	During construction, there is the potential for dust emissions to arise. Mitigation included in OPA Conditions and Construction Management Strategy.	LG Development (See Table 10.5)
Cumulative impacts are likely to be insignificant. Mitigation as described.	Cumulative impacts are likely to be insignificant. Mitigation as described.	Likely Cumulative Impacts and Mitigation

TABLE 10.9: LIKELY TYPE 2 CUMULATIVE IMPACTS DURING CONSTRUCTION OF THE DEVELOPMENTS

<sup>&</sup>lt;sup>23</sup> Including infrastructure at the existing Coryton South Substation at the CECL Power Station

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Likely Cumulative Impacts and Mitigation	Likely temporary significant adverse cumulative impacts during construction. Mitigation as described. These impacts will be temporary in nature, and as such the residual impact is assessed as not significant.	Cumulative impacts are likely to be insignificant. Mitigation as described.
LG Development (See Table 10.5)	Landscape impacts vary from Negligible / None to Major Adverse. Visual impacts vary from Negligible / None to Major Adverse. Aside from the measures discussed in the LG Development ES, DP World – London Gateway are not required to provide construction mitigation.	Despite the nature of the site, and the program of clearance and translocation undertaken, there is potential for impacts on ecological receptors. Mitigation included in OPA Conditions.
Gas Connection (See Table 10.2)	Landscape impacts may arise on Local Landscape Character due to construction. Visual impacts will arise from the presence of cranes, machinery, excavations and temporary structures, etc. Construction works will be screened by hoarding, where practical, to mitigate landscape and visual impacts near to sensitive receptors.	There is the potential for impacts on ecology to arise during the construction phase. Habitat surveys and protected species surveys will be undertaken prior to construction works commencing on site. Areas where protected species are known to occur or areas with the potential to support ecological habitat will be avoided where possible, and removal of habitat will not occur during the breeding season.
GEC (see Table 10.1)	It is unlikely that there will be any impacts on the landscape character. It is likely that visual impacts will occur. Construction works will be screened by hoarding, where practical, to mitigate and landscape and visual impacts near to sensitive receptors.	Due to the nature of the site, and the program of clearance and translocation undertaken, there is limited potential for impacts on ecological receptors. Habitat surveys (and, if required, protected species surveys) will be undertaken prior to construction works commencing on site. Measures to introduce biodiversity enhancements on and off site will be identified.
Electrical Connection <sup>23</sup>	Landscape impacts may arise on Local Landscape Character due to construction. Visual impacts will arise from the presence of cranes, machinery, excavations and temporary structures, etc. Construction works will be screened by hoarding, where practical, to mitigate landscape and visual impacts near to sensitive receptors.	There is the potential for impacts on ecology to arise during the construction phase. Habitat surveys and protected species surveys will be undertaken prior to construction works commencing on site. Areas where protected species are known to occur or areas with the potential to support ecological habitat will be avoided where possible, and removal of habitat will not occur during the breeding season.
Impact	Landscape and Visual	Ecology

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Impact	Electrical Connection <sup>23</sup>	GEC (see Table 10.1)	Gas Connection (See Table 10.2)	LG Development (See Table 10.5)	Likely Cumulative Impacts and Mitigation
Water Quality	There is the potential for impacts on controlled waters to arise. This impact will be managed and controlled through a CEMP and drainage strategy. No untreated water will be allowed to drain to controlled waters. Any water crossings will be designed to reduce impacts on water	There is the potential for impacts on controlled waters to arise. This impact will be managed and controlled through a CEMP and drainage strategy.	There is the potential for impacts on controlled waters to arise. This impact will be managed and controlled through a CEMP and drainage strategy. No untreated water will be allowed to drain to controlled waters. Any water crossings will be designed to reduce impacts on water bodies.	There is the potential for impacts on controlled waters to arise. Mitigation included in OPA Conditions and Construction Management Strategy.	No cumulative impacts identified.

	Likely Cumulative Impacts and Mitigation	No cumulative impacts identified.
	LG Development (See Table 10.5)	Due to the location of the LG Development site, and the historical land uses, there is a high potential for contamination to be present on site. Contaminants (such as fuels and concrete) will be used on site. There is the potential for land contamination to occur as a result of spillages. Mitigation included in OPA Conditions and Construction Management Strategy.
	Gas Connection (See Table 10.2)	Contaminants (such as fuels and concrete) will be used on site. There is the potential for land contamination to occur as a result of spillages. This impact will be managed and controlled through a CEMP. Procedures will be put in place to deal with any pollution spills / hotspots encountered.
	GEC (see Table 10.1)	Due to the location of the site, and the historical land uses, there is a high potential for contamination to be present on site. Contaminants (such as fuels and concrete) will be used on site. There is the potential for land contamination to occur as a result of spillages. A full program of remediation will be undertaken prior to the construction. A risk assessment will be carried out prior to the commencement of construction. A risk assessment will be carried out prior to the commencement of construction work on site. This impact will be managed and controlled through a CEMP. Procedures will be put in place to deal with any pollution spills.
OFF	Electrical Connection <sup>23</sup>	Contaminants (such as fuels and concrete) will be used on site. There is the potential for land contamination to occur as a result of spillages. This impact will be managed and controlled through a CEMP. Procedures will be put in place to deal with any pollution spills / hotspots encountered.
<b>PARSONS</b> BRINCKERH	Impact	Geology and Land Contamination

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GEC HV Electrical Connection – Environmental Report November 2012

PARSONS BRINCKERH	IOFF				
Impact	Electrical Connection <sup>23</sup>	GEC (see Table 10.1)	Gas Connection (See Table 10.2)	LG Development (See Table 10.5)	Likely Cumulative Impacts and Mitigation
Land Use	Land required will be minimised during electrical connection route selection. The land used temporarily for laydown / occupation will be subject to protection measures during the construction works, and re-instated after.	No impacts anticipated.	Temporary loss of productive agricultural land. The land used temporarily for laydown / occupation will be subject to protection measures during the construction works, and re-instated after.	No impacts anticipated.	No cumulative impacts identified.
Traffic	There may be additional construction traffic in the form of HGVs and construction personnel vehicles. Traffic will be managed and controlled through a CTMP.	There may be additional construction traffic in the form of HGVs and construction personnel vehicles. Traffic will be managed and controlled through a CTMP.	There may be additional construction traffic in the form of HGVs and construction personnel vehicles. Traffic will be managed and controlled through a CTMP.	There may be additional construction traffic in the form of HGVs and construction personnel vehicles. Mitigation included in OPA Conditions.	Cumulative impacts are likely to be insignificant. Mitigation as described.

	Likely Cumulative Impacts and Mitigation	No cumulative impacts identified.
	LG Development (See Table 10.5)	Due to the nature of the site, and its historical uses, there is potential for impacts on cultural heritage and archaeology. Mitigation included in OPA Conditions and Construction Management Strategy.
	Gas Connection (See Table 10.2)	The cultural heritage in the area is well understood from the work undertaken for GEC and the LG Development / undertaking of agricultural activities. There is a potential for the setting of cultural heritage features (i.e. Listed Buildings) to be subject to landscape and visual impacts. There is also a potential for unknown cultural heritage features to be impacted upon. Depending on the understanding of the cultural heritage potential, a range of mitigation measures can be implemented. These range from using a targeted Archaeological Watching Brief to alteration of the construction technique. The residual impact is assessed as minor adverse / not significant depending on whether any unknown cultural heritage features are heritage features are
	GEC (see Table 10.1)	The cultural heritage in the area is well understood from the work undertaken for the LG Development. As such, the existence and whereabouts of any existing cultural heritage features which have the potential to be impacted upon are already well understood. It is unlikely that there will be any archaeological remains of significance. An assessment of the likelihood of archaeological remains of significance on the proposed site will be undertaken and prior to construction, a plan of archaeological works will be developed in conjunction with the Essex County Archaeological remains archaeological remains archaeological remains archaeological remains archaeological remains archaeological remains archaeological remains archaeological remains archaeological watching brief will be used during construction.
OFF	Electrical Connection <sup>23</sup>	The cultural heritage in the area is well understood from the work undertaken for GEC, the underground gas pipeline and associated AGI, and the LG Development. There is a potential for the setting of cultural heritage features (i.e. Listed Buildings) to be subject to landscape and visual impacts. There is a potential for unknown cultural heritage features to be impacted upon. Depending of the cultural heritage potential, a range of mitigation measures can be implemented. The residual impact is assessed as not significant.
<b>PARSONS</b> BRINCKERH	Impact	Cultural Heritage

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PARSONS BRINCKERHOF	7				
Impact Elec	ctrical mection <sup>23</sup>	GEC (see Table 10.1)	Gas Connection (See Table 10.2)	LG Development (See Table 10.5)	Likely Cumulative Impacts and Mitigation
Socio-Economics impo be p mitig	rt term employment ortunities during the struction works. socio-economic acts are deemed to oositive, therefore no gation is required.	Short term employment opportunities during the construction works. The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	Short term employment opportunities during the construction works. The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	Short term employment opportunities during the construction works. The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	Positive cumulative impacts identified. No mitigation required.
The coni desi cons the l rele Prac Rec Stat The asse sign	electrical nection will be igned and structed in line with latest editions of the vant Codes of vant Codes of ctice, Standards, ctice, Standards, commendations and tutory Legislation. residual impact is essed as not ificant.	GEC will be designed and constructed in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation. The residual impact is assessed as not significant.	The gas connection will be designed and constructed in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation. The residual impact is assessed as not significant.	N / A	No cumulative impacts identified.
The envi to c: heal mitig The addi requ drav Hea Plar The asse sign	aspects of the ironment most likely ause impacts on th wil be subject to gation measures. refore no specific itional mitigation sures may be why together in a why together in a lith Management h (HMP). residual impact is essed as not	The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a Health Management Plan (HMP). The residual impact is assessed as not significant.	The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a Health Management Plan (HMP). The residual impact is assessed as not significant.	N / A	No cumulative impacts identified.

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TABLE 10.10: LIKELY TYPE 2 CUMULATIVE IMPACTS DURING OPERATION OF THE DEVELOPMENTS

Impact	Electrical Connection <sup>24</sup>	GEC (see Table 10.3)	Gas Connection (See Table 10.4)	LG Development (See Table 10.6)	Likely Cumulative Impacts and Mitigation
Air Quality	No impacts identified.	Emissions of nitrogen oxides (NO <sub>x</sub> ). GEC will be equipped with proven pollution control technology, which will limit the production of NO <sub>x</sub> to a level below that required by the LCPD. The residual impact is assessed as not significant.	No impacts identified.	There may be local air quality effects and greenhouse gas effects associated with the operation of the LG Development. Mitigation included in OPA Conditions.	Cumulative impacts are likely to be insignificant. Mitigation as described.
Noise and Vibration	No impacts identified.	There may be continuous low level noise from GEC. GEC will feature integral acoustic enclosures designed to ensure that noise levels generated are within the acceptable limits. The residual impact is assessed as not significant.	There is the potential for low level noise associated with the AGI. High specification, low noise plant will be specified during the design phase. Regular maintenance checks will be carried out to ensure plant is working efficiently. Broken or faulty plant will be repaired or replaced.	There may be traffic and industrial noise associated with the operation of the LG Development which will increase the baseline noise levels. Mitigation included in OPA Conditions.	Cumulative impacts are likely to be insignificant. Mitigation as described.

 $<sup>^{24}</sup>$  Including infrastructure at the existing Coryton South Substation at the CECL Power Station

PARSONS BRINCKERH	OFF				
Impact	Electrical Connection <sup>24</sup>	GEC (see Table 10.3)	Gas Connection (See Table 10.4)	LG Development (See Table 10.6)	Likely Cumulative Impacts and Mitigation
Landscape and Visual	During operation, the only visible features of the development will be the extension to the existing Coryton South Substation at the CECL Power Station, the joint bays (or transitional bays) and the marker posts / plates The existing Coryton South Substation will likely be screened by the existing development in the area. The joint bays (or transitional bays) and marker posts / plates will be low likely and will likely not be visible.	It is unlikely that there will be any impacts on the landscape character. It is likely that visual impacts will occur. GEC will be situated on land within the LG Development. Materials and finishes will be selected to minimise maintenance requirements, and be sympathetic to the appearance of the surrounding LG Development. the residual impact is assessed as not significant.	During operation, the only visible feature of the development will be the AGI. It is likely that there will be landscape and visual impacts associated with the AGI. The landscape and visual impact of the associated AGI will be screened by planting to reduce visual impacts.	Landscape impacts vary from Moderate Benefit to Minor Adverse. Visual impacts vary from Moderate Adverse. The LG Development has been designed to minimise any landscape and visual impacts. Mitigation included in OPA Conditions.	Cumulative impacts are likely to be insignificant. Mitigation as described.
Ecology	No impacts identified.	Limited potential for ecological impacts.	No impacts identified.	Despite the nature of the site, and the program of clearance and translocation undertaken, there is potential for impacts on ecological receptors. Mitigation included in OPA Conditions.	Cumulative impacts are likely to be insignificant. Mitigation as described.
Water Quality	No impacts identified.	No impacts identified.	No impacts identified.	No impacts identified.	No cumulative impacts identified.

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Impact	Electrical Connection <sup>24</sup>	GEC (see Table 10.3)	Gas Connection (See Table 10.4)	LG Development (See Table 10.6)	Likely Cumulative Impacts and Mitigation
Geology and Land Contamination	No impacts identified.	No impacts identified.	No impacts identified.	The geology, hydrogeology and land contamination impacts are deemed to be positive due to the regeneration of a contaminated site.	No cumulative impacts identified.
Land Use	Permanent occupation of land by extension of existing Coryton South Substation at the CECL Power Station. Productive agricultural land required will be minimised.	No impacts identified.	Permanent occupation of agricultural land by AGI. The landowner will be compensated by financial means for the permanent occupation of land. Productive agricultural land required will be minimised.	No impacts identified.	Cumulative impacts are likely to be insignificant. Mitigation as described.
Traffic	No material impacts identified.	No material impacts identified.	No material impacts identified.	Large traffic volumes and movement associated with the operation of the Port and Business and Logistics Park. Mitigation included in OPA Conditions and Obligations.	Following mitigation, cumulative impacts are likely to be insignificant.
Cultural Heritage	No impacts identified.	No impacts identified.	No impacts identified.	No impacts identified.	No cumulative impacts identified.
Socio-Economics	No impacts identified.	The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	No impacts identified.	The socio-economic impacts are deemed to be positive, therefore no mitigation is required.	Positive cumulative impacts identified. No mitigation required.

GEC HV Electrical Connection – Environmental Report November 2012

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PARSONS BRINCKERH(	OFF				
Impact	Electrical Connection <sup>24</sup>	GEC (see Table 10.3)	Gas Connection (See Table 10.4)	LG Development (See Table 10.6)	Likely Cumulative Impacts and Mitigation
Safety	The electrical connection will be operated in line with the atest editions of the relevant Codes of Practice, Standards, Practice, Standards, Accommendations and Statutory Legislation. Statutory Legislation. The residual impact is assessed as not significant.	GEC will be operated in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation. The residual impact is assessed as not significant.	The gas connection will be operated in line with the latest editions of the relevant Codes of Practice, Standards, Recommendations and Statutory Legislation. The residual impact is assessed as not significant.	N NA	No cumulative impacts identified.
	The aspects of the anvironment most likely to cause impacts on nealth will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a Health Management Plan. The residual impact is assessed as not significant.	The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a Health Management Plan. The residual impact is assessed as not significant.	The aspects of the environment most likely to cause impacts on health will be subject to mitigation measures. Therefore no specific additional mitigation is required. However, applicable mitigation measures may be drawn together in a Health Management Plan. The residual impact is assessed as not significant.	N / A	No cumulative impacts identified.

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FIGURES















APPENDIX A

SCREENING OPINION FROM THURROCK BOROUGH COUNCIL



## Major Projects (Planning), Thurrock Council, CO2 2<sup>nd</sup> Floor, Civic Offices, New Road, Grays Thurrock, Essex RM17 6SL www.thurrock.gov.uk

Thurrock Council welcomes Typetalk calls

Our Ref: 12/00599/SCR Your Ref:CB/2746D Direct Dial: (01375) 366544

Date: 12<sup>th</sup> July 2012

Email: mgallagher@thurrock.gov.uk

**BY E-MAIL** 

Chris Brake Dalton Warner Davis LLP 21 Garlick Hill London EC4V 2AU

Dear Chris

# RE: Town and Country Planning (Environmental Impact Assessment) Regulations 2011 – Request for Screening Opinion of the Local Planning Authority

Proposal: High voltage underground electrical connection and ancillary works

Location: Land between the site of the proposed Gateway Energy Centre and the National Grid Coryton South Substation, The Manorway, Stanford-le-Hope, Essex

I refer to your recent request, dated 29<sup>th</sup> June 2012, for a Screening Opinion pursuant to Part 2, Regulation 5 of the above Regulations. You request was received by this Authority on 2<sup>nd</sup> July 2012.

# Determination of Whether Schedule 1 or Schedule 2 Development

The description of the proposed development does not fall within any of the categories of Schedule 1 development, where Environmental Impact Assessment (EIA) is always required.

Within the Table referred to by Schedule 2 of the Regulations, reference is made at Part 3 to the "Energy Industry". Although Paragraph 3b refers to "industrial installations for carrying gas, steam and hot water", there is no specific reference in Part 3, or elsewhere within Schedule 2, to underground cables for the transmission of electricity. The proposals also include reference to a connection to the Gateway Energy Centre Substation located within the Gateway Energy Centre site and an extension of the National Grid Coryton South Substation located within the Coryton





power station site. However, there is no specific reference within Schedule 2 to these categories of works.

However, case law suggests that the types of development listed within Schedule 2 should be interpreted widely, as the EIA Directive has a wide scope and a broad purpose. The fact that a particular type of development is not specifically mentioned within the categories of projects listed, does not imply that the EIA regulations are not applicable. It is therefore prudent to take a precautionary approach to screening.

Part 10 of the Table referred to in Schedule 2 refers generally to "Infrastructure Projects". Sub-paragraph (a) of Part 10 refers to "industrial estate development projects". The proposed underground electricity connection and associated infrastructure would be partly used to supply electricity to the London Gateway port and logistics park development. Indeed, the submitted Screening Report notes that, when operational, up to 150MW of energy will be available to London Gateway from the total generation capacity of 900MW. In this context, the proposals could be considered as comprising infrastructure supporting an industrial estate development project. Adopting a wide interpretation of the Regulations, it is considered that the proposals could be considered as falling within the ambit of Schedule 2, Paragraph 10(a).

The applicable threshold for screening developments falling within Paragraph 10(a) is an area of development exceeding 0.5 hectares. In this case, the corridor of land being used for screening purposes (Figure 1) is approximately 30 hectares in area.

### **Screening Opinion**

Schedule 3 of the 2011 Regulations sets out the selection criteria for screening developments that may require an EIA. The key criteria are:

- 1. characteristics of the development;
- 2. location of the development;
- 3. characteristics of potential impact.

On the basis of the submitted request, the Council considers that the proposed development will not be so significant in the location proposed as to require the submission of an EIA. The conclusion is that the proposal is a Schedule 2 development, but **DOES NOT** require an EIA. The reasons for this determination are as follows:

Characteristics of the Development -

- although the red-line site boundary, for the purposes of screening, has been drawn flexibly and contains an area of land totalling approximately 30 hectares, the land-take associated with the eventual route of the electricity connection and ancillary development will be modest;
- the western part of the site is located within the London Gateway development site, which has been subject to its own EIA. The applications for the Gateway Energy Centre and its associated underground gas connection were also subject to EIA. The Environmental Statements accompanying these applications considered the impact of the electricity connection based on a worst-case overhead transmission line scenario. As an underground connection is now proposed, it is considered that there would be no issues arising from the cumulative impact of developments;

- the proposals would not have a significant effect on the use of natural resources;
- the proposals would not result in the production of significant waste, pollution or nuisances;
- the proposals would not significantly increase the risk of accidents.

Location of Development -

- the site does not form part of any designated site of ecological interest. Mucking Flats SSSI / Ramsar site is located to the south-west of the site and on the opposite side of the London Gateway site. Vange & Fobbing Marshes SSSI is located to the north of the site;
- the proposals would not have a significant impact on the abundance, quality or regenerative capacity of natural resources in the area;
- although the site is located relatively close to wetlands and coastal zones, the proposals would not have a significant impact on the absorption capacity of the natural environment.

Characteristics of Potential Impact -

- the potential impacts of the proposal would be localised in their extent and would not affect a significant residential population;
- there would be no transfrontier impacts;
- the magnitude and complexity of impacts are unlikely to be significant or extensive;
- if planning permission is granted, it is likely that planning conditions could be used to control the probability of impacts;
- the duration and frequency of impacts would only affect a small number of receptors and could potentially be controlled by condition.

I trust that these comments are of assistance. If you have any queries regarding the content of this letter please contact me. Please note that this letter refers to the 2011 Regulations only and is without prejudice to the consideration and determination of any future planning application.

Yours sincerely,

Mballahi

Matthew Gallagher Planning Development Officer

Our Ref: J:\ENV\PLAN\DEVCTRL\Major Projects\Planning Application Data\Planning Apps thurrock Council (2012)\12-00599-SCR-Gateway Energy Centre\Screening Opinion 12.07.12.doc



APPENDIX B

# SUMMARISING CORRESPONDANCE FROM CONSULTATION WITH KEY STAKEHOLDERS



**RESPONSE FROM NATURAL ENGLAND** 

From: McArthur, Thomas Sent: 26 June 2012 10:18 To: Bustard, Jonathan (NE) Cc: Agus, Emily; Sturges, Phil (NE); Cheung, Vicky Subject: RE: Thaven Haven: Grid Connection

Dear Jonathan,

Thank you kindly for returning comments so quickly, I know InterGen will be most appreciative of the timing.

We feel your comments and suggestions and all relevant and the recommendations pertinent and realistic. As such we'll be sure to adopt them where relevant and / or include sufficient justification or details within the various forthcoming reporting.

Once again many thanks for the prompt response and do call if you have any further queries,

Kind regards,

#### **Tom McArthur**

MSC DIC CEnv MIEEM Senior Ecologist, Environment **Parsons Brinckerhoff** 6 Devonshire Square, London, EC2M 4YE 44-(0)20-7337-1819 (office) 44-(0)7900-136384 (mobile)

mcarthurt@pbworld.com www.pbworld.com

From: Bustard, Jonathan (NE) [mailto:Jonathan.Bustard@naturalengland.org.uk] Sent: 25 June 2012 13:20 To: McArthur, Thomas Cc: Agus, Emily; Sturges, Phil (NE); Cheung, Vicky Subject: RE: Thaven Haven: Grid Connection

Our ref:- 57039

Dear Tom

As advised earlier today, I write with comments on both Vicky's email and your Phase 1 report linked to the Gateway Energy centre grid connection application. This also follows the meeting at our (now former) Colchester office the other week.

Overall, Natural England is satisfied with the detail provided, comprising the Phase 1 survey and scope of additional surveys to follow. We understand that these will focus

on surveys for great crested newt, badger, water vole, reptiles, and terrestrial invertebrates as appropriate to the sections of the route. We would be grateful for clarification of one or two points.

- Section 1. The report describes this section of the route as an active construction / development site, "devoid of vegetation". However elsewhere this section is noted as inaccessible, and I understand the description is dependent upon the letter in appendix B – which whilst confirming the removal of various protected species, does not appear to confirm the assertions made in the report. Elsewhere in the report the term "significant vegetation" is used, however this description is not qualified. Whilst we accept gist of these statements, it would be helpful to clarify, as should an early succession vegetative community be establishing this may present opportunities for invertebrates of note as the season progresses. We suggest this area is kept under watching brief for avoidance of doubt.
- 2) We note that no additional desk study has been made of the route, rather reliance on data gathered for linked applications. Whilst this is not in itself unreasonable, we request clarification of certain points: e.g. para 2.1.3 and footnote – please clarify the source of invertebrate data and whether this was not available (i.e. nil return) or not provided. We advise that for invertebrate data (although not exclusively), the Essex Field Club should be the principal source (they host a DataSearch web facility). Further enquiries should be made if EFC have not been consulted.
- 3) We had some initial reservations about the comments as to the suitability of the site (esp section 3) for dormice, from the comments in Vicky's email, in particular due to the presence of significant areas of scrub habitat, and possible linkage via railway corridor. However this rationale is expanded in the Phase 1 report, and we accept that dormice presence is unlikely, and not at a level to justify survey. Again a watching brief should be maintained if scrub required removal.
- 4) We note that three survey visits for terrestrial invertebrates have been made, and welcome the range of sources cited in the desk study (including All of a Buzz) however please see above comments on Essex Field Club. We suggest that the invertebrate scoping exercise carried out should be used to determine levels of survey employed, and having not seen these results, we cannot comment on, or rule out, the possibility that further visits (e.g. late summer) might be appropriate. We would expect that the scoping exercise (or later commentary) would discuss such matters as nectar / food plant resource (e.g. seasonal profile) for certain key species (e.g. the BAP bee species cited earlier in the report), so as to judge how conducive the "mosaic" is to the invertebrate assemblage.
- 5) On bats, we agree impacts largely negligible, but comment that any requirements for lighting may disrupt foraging / roosting along the willow / poplar tree line to the north-east of section 3. Mitigation should be designed accordingly.

6) We note some caution as to final routes and methodologies (e.g. trenching / HDD), and assume that the impact assessment (which in email form is arguably premature) will make allowances for. We reserve judgement where such changes might be made, but accept that all information is not necessarily available at the time. Mitigation should also retain flexibility accordingly.

We hope the above comments are helpful to you at this time. Please contact us again should you wish to discuss the above further.

Yours sincerely Jonathan

Jonathan Bustard Lead Adviser Land Use Operations Natural England Mob. 07721 783366

www.naturalengland.org.uk

We are here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

In an effort to reduce Natural England's carbon footprint, I will, wherever possible, avoid travelling to meetings and attend via audio, video or web conferencing.

#### **IMPORTANT INFORMATION**

The Colchester office will be closing on 15<sup>th</sup> June 2012 and, after that date, I will become a contractual home-worker. My 0300 number will then be surrendered (although a divert to my mobile will be in place for a short time). E-mail is our preferred method of communication. If absolutely necessary, any postal correspondence should be addressed for my attention to Natural England, Mail Hub Block B, Whittington Road, Worcester WR5 2LQ

From: McArthur, Thomas [mailto:McArthurT@pbworld.com] Sent: 15 June 2012 13:08 To: Bustard, Jonathan (NE) Cc: Agus, Emily; Sturges, Phil (NE); Cheung, Vicky Subject: Thaven Haven: Grid Connection

Dear Jonathan,

Thanks for your time yesterday morning. The final phase 1 habitat report for the project can be found appended to the following link. As discussed the report will provide greater background to

project and help inform your assessment you undertake. It also includes a series of maps and plans which will help guide you although the exact route alignment is yet to be agreed.

#### https://ftp.pbworld.com/GetFile.aspx?fn=1408332508.zip

Following our conversation yesterday, I have learnt that InterGen will be submitting their application screening documents on Thursday 21<sup>st</sup> June. I understand you already have an extremely busy work schedule planned but hoped you would be able to undertake a brief review of the scope of Phase 2 surveys. A full more detailed assessment, should you consider it necessary could be undertaken in your own time but we would be very keen to receive your take on whether the scope of which Phase 2 species surveys we have completed or propose to complete is considered accurate and satisfactory. This information is summarised within the table below. Please note that since Vicky drafted the below table, PB have decided to undertake three terrestrial invertebrate surveys, rather than the initially reported two; they will be undertaken between April and July 2012.

I hope to hear from you early next week with your initial views on the scope.

Please call if you have any queries and best of luck with the office move.

Kind regards and many thanks in advance.

#### Tom McArthur MSC DIC CEnv MIEEM Senior Ecologist, Environment *Parsons Brinckerhoff* 6 Devonshire Square, London, EC2M 4YE 44-(0)20-7337-1819 (office) 44-(0)7900-136384 (mobile)

mcarthurt@pbworld.com www.pbworld.com

From: Cheung, Vicky Sent: 24 May 2012 12:21 To: <u>jonathan.bustard@naturalengland.org.uk</u> Cc: Agus, Emily; McArthur, Thomas; <u>phil.sturges@naturalengland.org.uk</u> Subject:

Dear Jonathan

Further to our conversation regarding the Gateway Energy Centre (Thames Haven) site, please see below the summary e-mail as discussed.

Section 36 Consent for the Gateway Energy Centre (GEC) Combined Cycle Gas Turbine power station was granted in August 2011, and Planning Permission for the Underground Gas Pipeline and Associated Above Ground Infrastructure (AGI) was granted in March 2012.

In terms of the HV Electrical Connection, the Environmental Statements and Further Information Documents which accompanied those applications assumed a "worst case" scenario based on an entirely new Overhead Transmission Line and new Substation, potentially sited in the Green Belt. This option (i.e. Overhead Transmission Line and Substation in the Green Belt) are no longer being pursued, and it is envisaged that the majority of the development will be within the previously developed area south of the A1014 (the Manorway).

It will be proposed in a 'Request for Screening Opinion' to Thurrock Council, that the development / operation of the new HV Electrical Connection will be designed and managed in such a way that it will not comprise EIA Development. However, the application will be accompanied by an Ecological Assessment, Water Resources Assessment and a Construction Environmental Management Plan (CEMP) which will inform the consenting process and conditions to be applied.

The following Table acts as a summary of the recent Phase 1 Habitat Survey undertaken for the GEC HV Electrical Connection, and presents a preliminary assessment of ecological value and likely impacts. This assessment has been made with reference to the previous Environmental Impact Assessment work reported in the Environmental Statement for the GEC CCGT Power Plant and the GEC Underground Gas Pipeline and Associated Above Ground Installation (AGI). The Table further identifies which further Phase 2 Surveys are being undertaken to confirm the baseline conditions and to inform the Ecological Assessment.

Further details are provided in the Phase 1 Habitat Survey Report which will follow in due course.

We would appreciate your confirmation that our approach regarding the ecological value of the site and further Phase 2 Surveys to confirm findings is acceptable to Natural England. If you have any questions please do not hesitate to contact me.

# Proposed Electrical Connection

Following our meeting at your offices on the 20 April, further Routing Studies for the HV Electrical Connection have taken place. The HV Electrical Connection Route figures will be sent through to you shortly.

The benefits of this amended Route (in comparison to the one which was presented at the meeting on 20 April) is that it is now considered unlikely that any construction works will be undertaken in the Northern Triangle. If construction work would be required within the

Northern Triangle, this would comprise: Horizontal Directional Drilling (HDD); and, drilling sites for HDD only.

*Results of Phase 1 Habitat Survey, Preliminary Assessment of Ecological Value / Likely Ecological Constraints and Impacts, and Proposals for 'Confirmation' Phase 2 Surveys* 

For the purposes of the Table, the proposed HV Electrical Connection has been divided into three broad sections. These are:

- Section 1: The Western Section located within the operational DP World Construction Site.
- Section 2: The Northern Section, which passes along the route of the Cycle Path. This area encompasses: the A1014 (the Manorway); a Cycle Path; the Manorway Fleet; and, part of the Northern Triangle (DP World / LG Development Receptor Site).
- Section 3: The Eastern Section, which passes in close proximity to the existing Coryton Power Station Gas Pipeline and Overhead 400kV Electrical Transmission Lines.

# Potential Impacts

The potential impacts of the proposed construction of the HV Electrical Connection, in the absence of any mitigation, could include:

- Temporary habitat loss;
- Temporary habitat fragmentation and degradation;
- Direct mortality and / or injury of notable and protected species and habitats during site clearance and construction;
- Disturbance to ecological receptors (including notable and protected species and habitats) from construction works; and
- Pollution caused by use of hazardous materials and incidental release of chemicals, fuels or waste materials.

During operation, no potential impacts are anticipated.

During decommissioning, no potential impacts are anticipated.

# Preliminary Assessment of Impacts - Assumptions

• The majority of the HV Electrical Connection Route will likely comprise Open Cut methods. The Working Width will be between 10 and 30 m wide, and the trench will be approximately 1.5 m in depth.

- HDD Sections will take place for the crossing of the A1014 (The Manorway).
- It is unlikely that any construction works will be undertaken in the Northern Triangle. If construction
  work would be required within the Northern Triangle, this would comprise: Horizontal Directional
  Drilling (HDD); and, drilling sites for HDD only.
- Mitigation measures to be employed will be agreed under the CEMP.

Species / Habitat	<i>Comments – Summary Results from Phase 1 Habitat Survey</i>	Preliminary Assessment of Ecological Value / Likely Ecological Constraints	<i>'Confirmation' Phase 2 Surveys</i>
Site Overview (Flora / NVC)	The habitats are all relatively common place and / or widespread within the local area. <i>Western Section:</i> This Section consists of a construction site associated with the LG Development. <i>Northern Section:</i> This Section comprises: the A1014 (the Manorway); a Cycle Path; the Manorway Fleet; and, part of the Northern Triangle (DP World / LG Development Receptor Site). <i>Eastern Section:</i> This Section is well interconnected, with no clear boundaries	<ul> <li>Western section:</li> <li>This Section does not provide habitats suitable for any ecological receptors.</li> <li>Northern Section:</li> <li>Northern Section:</li> <li>The A1014 (the Manorway) and the Cycle Path do not provide habitats suitable for any ecological receptors.</li> <li>An area of land between the Cycle Path and the Northern Triangle comprises scrub and grassland habitats with suitability for ecological receptors such as bats, birds, invertebrates and reptiles.</li> <li>The Manorway Fleet and the Northern Triangle provide habitats with suitability for ecological receptors such as bats, birds, invertebrates and reptiles.</li> </ul>	N / A – the Habitats present comprise common and widespread Habitats with low potential for any notable or protected floral species to be present. No further Habitat or Botanical Surveys are considered necessary in order to inform the impact assessment or to determine the necessary mitigation measures.

	between different Land Owners (i.e. Shell / PetroPlus). This Section comprises a diverse network of: overgrown / rank grassland; scrub; scattered trees; and, various water bodies.	Bats; Water Voles; GCN; Reptiles; Breeding Birds; and, Wintering Birds. It is unlikely that any construction works will be undertaken within this area.	
		Eastern Section:	
		This Section provides habitats suitable for: Badgers; Bats; Water Voles; GCN; Reptiles; Breeding Birds; and, Invertebrates.	
		The construction works in this section have the potential to result in adverse impacts on the habitats present – see individual species sections below:	
	Western Section:	Western Section:	Western Section:
	Suitable Habitat was not recorded within the proposed works area, there is some potential for badgers in surrounding areas.	Habitat areas with potential suitability for badgers are present within scrub along the railway line near this area, and will be surveyed as a	A Phase 2 Badger survey is being undertaken to check the nearby scrub areas. <i>Northern Section:</i>
Badger	Northern Section:	precaution.	N / A
	There is limited potential for Badgers.	Northern Section:	Eastern Section:
	Eastern Section:	N / A Fastern Section	A Phase 2 Badger Survey is being undertaken to fully
	The Phase 1 Habitat Survey noted Habitat	Whilst there may be	inform the future Impact Assessment

	suitable for Badger.	temporary direct impacts during construction, such as temporary habitat loss, temporary fragmentation, temporary disturbance, the residual impact is likely to be not significant. Mitigation and monitoring measures will comprise: a Pre-Construction Survey; Best Practice Construction Methods; use of an Ecological Watching Brief; and, Habitat Reinstatement	and to determine mitigation requirements. This will be reported in the Ecological Assessment to be submitted with the application. A comparison with this Preliminary Assessment will be made.
Bats	Western Section: Suitable Habitat was not recorded. There is no potential for Bats. Northern Section: Supports common and widespread habitat suitable for Bats (within the Northern Triangle and adjacent to, but not within the Manorway / Cycle Path). Eastern Sections: The Phase 1 Habitat Survey noted Habitat suitable for Bats.	Western Section: N / A Northern Section: The proposed HV Electrical Connection Route is outside the Northern Triangle, and is aligned along the Cycle Path (north of the A1014 (The Manorway), but south of the Manorway Fleet). This Route will avoid direct impacts during construction on Bats. If construction work is required within the Northern Triangle, mitigation and monitoring measures will include the use of	No further Phase 2 Bat Surveys are considered necessary.

		<ul> <li>HDD to avoid bisection of significant linear habitat. This will avoid direct impacts on Bats. Any temporary habitat loss associated with any works in this area will be mitigated for by the provision of suitable replacement habitat once works are completed.</li> <li><i>Eastern Section:</i></li> <li>Based on the proposed HV Electrical Connection Route, it is not considered that there will be any direct impacts on any potential Roost Sites. The proposed HV Electrical Connection Route, any bisection of significant Linear Habitat. This will avoid direct impacts on Bats. Any temporary habitat loss associated with any works in this area will be mitigated for by the provision of suitable replacement habitat once works are completed.</li> </ul>	
Dormice	Western Section: Suitable Habitat was not recorded. There is no potential for Dormice.	N/A	N / A
	Northern Section: Suitable Habitat was not recorded. There is no potential for Dormice. Eastern Section: Suitable Habitat was not recorded. There is no potential for Dormice.		
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Otters / Water Voles	<ul> <li>Western Section:</li> <li>Suitable Habitat was not recorded.</li> <li>There is no potential for Otters or Water Voles.</li> <li>Northern Section:</li> <li>There is limited potential for Otters.</li> <li>The Northern Triangle is known to support Water Vole Populations.</li> <li>Eastern Sections:</li> <li>There is limited potential for Otters.</li> <li>There is limited potential for Otters.</li> <li>There is limited survey noted Habitat Survey noted Habitat suitable for Water Voles.</li> </ul>	<ul> <li>Western Section:</li> <li>N / A</li> <li>Northern Section:</li> <li>The proposed HV</li> <li>Electrical Connection</li> <li>Route is located outside</li> <li>the Manorway Fleet</li> <li>and Northern Triangle,</li> <li>and is aligned along the</li> <li>Cycle Path (north of the</li> <li>A1014 (The Manorway),</li> <li>but south of the</li> <li>Manorway Fleet). This</li> <li>Route will avoid direct</li> <li>impacts during</li> <li>construction on Water</li> <li>Voles.</li> <li>If construction work is</li> <li>required within the</li> <li>Manorway Fleet /</li> <li>Northern Triangle,</li> <li>mitigation and</li> <li>monitoring measures</li> <li>will include the use of</li> <li>HDD. This will avoid</li> <li>direct impacts on Water</li> </ul>	<ul> <li>Western Section:</li> <li>N / A</li> <li>Northern Section:</li> <li>Collection and review of available information from DP</li> <li>World will be undertaken. This will be reported in the Ecological Assessment to be submitted with the application. A comparison with this Preliminary</li> <li>Assessment will be made.</li> <li>Eastern Section:</li> <li>A Phase 2 Water Vole survey is being undertaken to fully inform the future Impact Assessment and to determine mitigation requirements. This will</li> </ul>

		Voles. <i>Eastern Sections:</i> Whilst there may be temporary direct impacts during construction, such as temporary habitat loss, temporary disturbance, the residual impact is likely to be not significant. Mitigation and monitoring measures should comprise: Best Practice Construction Methods; use of an Ecological Watching Brief; minimising the working width across Water Bodies / Ditches; Habitat Manipulation;	be reported in the Ecological Assessment to be submitted with the application. A comparison with this Preliminary Assessment will be made.
	Western Costion	Reinstatement.	
	western Section:	Western Section:	Western Section:
	Suitable Habitat was	N / A	N / A
GCN	no potential for GCN.	Northern Section:	Northern Section:
	Northern Section:	The proposed HV Electrical Connection	Collection and review of available
	Known to support GCN Populations.	Route is outside the Manorway Fleet and	information from DP World will be
	Eastern Sections:	Northern Triangle, and is aligned along the	undertaken. This will be reported in the
	The Phase 1 Habitat Survey noted Habitat suitable for GCN.	Cycle Path (north of the A1014 (The Manorway), but south of the Manorway Fleet). This	Ecological Assessment to be submitted with the application. A comparison with this

Route will avoid direct impacts during construction on GCN.	Preliminary Assessment will be made.
If any construction work is required within the Manorway Fleet / Northern Triangle, a review of existing GCN monitoring data will be undertaken and the assessment of likely impacts will be re- visited to determine mitigation and licensing requirements. The aim will, however, be to use HDD in order to avoid any construction works in this area and thus to avoid direct impacts on GCN.	<i>Eastern Section:</i> A Phase 2 GCN Survey is being undertaken to fully inform the future Impact Assessment and to determine mitigation requirements. This will be reported in the Ecological Assessment to be submitted with the application. A comparison with this Preliminary Assessment will be made.
Eastern Sections:	
Whilst there may be temporary direct impacts during construction, such as temporary habitat loss, temporary fragmentation, temporary disturbance, the residual impact is likely to be not significant. Mitigation and monitoring measures should comprise: Best Practice Construction Methods; use of an Ecological Watching Brief; Appropriate Licences;	

Western Section:	Western Section: N / A Northern Section:
	N / A Northern Section:
	Northern Section:
Northern Section:	
Western Section:The proposed HV Electrical Connection Route is outside the is aligned along the is aligned along the Cycle Path (north of the A1014 (The Manorway), the but south of the Manorway Fleet). This to trecorded. There is 	Collection and review of available information from DP World will be undertaken. This will be reported in the Ecological Assessment to be submitted with the application. A comparison with this Preliminary Assessment will be made. <i>Eastern Section:</i> A Phase 2 Reptile is being undertaken to fully inform the future Impact Assessment and to determine mitigation requirements. This will be reported in the Ecological Assessment to be submitted with the application. A

		any construction works in this area and thus to avoid direct impacts on Reptiles. <i>Eastern Sections:</i> Whilst there may be temporary direct impacts during construction, such as temporary habitat loss, temporary habitat loss, temporary disturbance, the residual impact is likely to be not significant. Mitigation and monitoring measures should comprise: Best Practice Construction Methods; use of an Ecological Watching Brief; minimising the working width across Habitat; Habitat Manipulation; and Habitat Reinstatement.	Preliminary Assessment will be made.
	Western Section:	Western Section:	
Breeding Birds	Suitable Habitat was not recorded. There is no potential for Breeding Birds. <i>Northern Section:</i> Area with value for Breeding Birds (within the Northern Triangle).	N / A Northern Section: The proposed HV Electrical Connection Route is outside the Northern Triangle, and is aligned along the Cycle Path (north of the A1014 (The Manorway), but south of the	No further Phase 2 Breeding Birds Surveys are considered necessary.

	The Phase 1 Habitat Survey noted Habitat suitable for Breeding Birds.	Manorway Fleet). This Route will avoid direct impacts during construction on Breeding Birds. If construction work is required within the Northern Triangle, mitigation and monitoring measures will include undertaking construction works outside the bird nesting season. This will avoid direct impacts during construction on Breeding Birds. There may be a need for some mitigation in respect of nesting birds due to limited timescales for works in order to also avoid impacts on wintering birds (see below). <i>Eastern Sections:</i> Mitigation and monitoring measures will include undertaking construction works outside the bird nesting season. This will avoid direct impacts during construction on Breeding Birds.	
Wintering Birds	Western Section: Suitable Habitat was not recorded. There is no potential for	Western Section: N / A Northern Section:	No further Phase 2 Wintering Birds Surveys are considered necessary.

Wintering Birds.	The proposed HV	
Northern Section:	Electrical Connection	
Area with limited value	Northern Triangle, and	
for Wintering Birds	is aligned along the	
(within the Northern	Cycle Path (north of the	
Triangle).	A1014 (The Manorway),	
	but south of the	
Eastern Sections:	IVIANOFWAY FIEET). INIS Poute will avoid direct	
Cuitable Llabitat was	impacts during	
Suitable Habitat Was	construction on	
no notential for	Wintering Birds.	
Wintering Birds	Ŭ	
	If construction work is	
	required within the	
	Northern Triangle,	
	miligation and monitoring mossures	
	will include undertaking	
	construction works	
	outside the Wintering	
	Birds Season. This will	
	avoid direct impacts	
	during construction on	
	Wintering Birds. The	
	timing for works in this	
	area will thus need to be limited to the tail	
	end of the breeding	
	season and prior to the	
	wintering season, or the	
	tail end of the wintering	
	season, prior to	
	significant nesting	
	activity. Ecological	
	watching briefs and	
	areas with suitable	
	nesting habitat will then	
	be undertaken in order	
	to ensure no adverse	
	impacts on nesting	

		birds.	
		Eastern Sections:	
		N / A	
		Western Section:	
	Western Section:	N / A	
	Suitable Habitat was not recorded. There is no potential for	Northern Section: The proposed HV Electrical Connection Route is outside the Northern Triangle, and is aligned along the Cycle Path (north of the A1014 (The Manorway), but south of the Manorway Fleet). This Route will avoid direct impacts during construction on invertebrates.	One invertebrate
	Invertebrates.		
	Northern Section:		collected from the site (21 <sup>st</sup> May 2012), during
Invertebrates	There is potential for Invertebrates within the habitats adjacent to the Manorway and Cycle Path. The Northern Triangle provides suitable habitats for invertebrates.		suitable weather conditions, and a second sample is recommended during suitable weather conditions in June in order to confirm the exact and detailed mitigation
	Eastern Sections:	If construction work is	requirements. This
	The Phase 1 Habitat Survey noted Habitat that may be suitable for Invertebrates. An initial invertebrate assessment carried out on the 21 <sup>st</sup> May 2012 confirmed the suitability of the section for invertebrates, although no significant constraints to the proposed works were identified.	required within the Northern Triangle, and adjacent habitats, appropriate measures will be implemented in order to avoid, reduce and mitigate for any adverse impacts (envisaged to only be temporary). The aim will, however, be to use HDD in order to avoid any construction works in this area and thus to avoid direct impacts on invertebrates.	level of survey effort is considered suitable and appropriate in respect of the habitats present and the temporary nature of the proposed works, and no further survey is considered necessary.

	Eastern Sections:	
	Whilst there may be temporary direct impacts on invertebrates during construction, such as temporary habitat loss and temporary disturbance, the residual impact is likely to be not significant. Mitigation should comprise a range of measures such as: Best Practice Construction Methods; minimising working areas to reduce habitat losses and Habitat Reinstatement.	

As discussed your feedback on this would be very much appreciated so we can confirm this approach and the scope of surveys, and so we look forward to hearing from you next week (please let me know if there are any problems with this timescale).

Many Thanks and Kind Regards,

Vicky.

#### Vicky Cheung (nee Smith)

BSc CEnv MIEEM Principal Ecologist, Environment *Parsons Brinckerhoff* 6 Devonshire Square London, EC2M 4YE 44- (0)20-7337-1810 (office) 44-(0)7581-536578 (mobile)

vicky.cheung@pbworld.com www.pbworld.com NOTICE: This communication and any attachments ("this message") may contain confidential information for the sole use of the intended recipient(s). Any unauthorized use, disclosure, viewing, copying, alteration, dissemination or distribution of, or reliance on this message is strictly prohibited. If you have received this message in error, or you are not an authorized recipient, please notify the sender immediately by replying to this message, delete this message and all copies from your e-mail system and destroy any printed copies. This email and any attachments is intended for the named recipient only. If you have received it in error you have no authority to use, disclose, store or copy any of its contents and you should destroy it and inform the sender. Nothing in the email amounts to a legal commitment on our part unless confirmed by a signed communication. Whilst this email and associated attachments will have been checked for known viruses whilst within the Natural England systems, we can accept no responsibility once it has left our systems. Communications on Natural England systems may be monitored and/or recorded to secure the effective operation of the system and for other lawful purposes.

**RESPONSE FROM ENVIRONMENT AGENCY** 

From: Hardwick, Jo [mailto:jo.hardwick@environment-agency.gov.uk] Sent: 17 April 2012 15:16 To: Agus, Emily Subject: RE: Gateway Energy Centre

Emily

I'd be happy with you including this wording though it might benefit from you saying *Water Resources (in particular with respect to crossing the Manorway Fleet).* 

I've emailed my internal colleagues with an update following our telcon and asked them to contact me if they are concerned there maybe any significant issues before the screening opinion is received. Obviously I'll pass them on if received, but I consider it unlikely.

Kind regards Jo

From: Agus, Emily [mailto:AgusE@pbworld.com] Sent: 17 April 2012 14:40 To: Hardwick, Jo Subject: RE: Gateway Energy Centre

Jo,

Thanks for your time today. As discussed, for the Screening Report we would include some text along the lines of:

Informal consultation with the Environment Agency has indicated the need for an assessment of:

- Flood Risk (at the proposed Substation Extension site);
- Water Resources (in particular with respect to the Manorway Fleet); and,
- Land contamination.

Would you be happy with us including that wording?

Kind Regards, Emily.

From: Hardwick, Jo [mailto:jo.hardwick@environment-agency.gov.uk] Sent: 17 April 2012 10:24 To: Agus, Emily Subject: RE: Gateway Energy Centre

Thanks Emily, speak later Jo

From: Agus, Emily [mailto:AgusE@pbworld.com] Sent: 16 April 2012 16:30 To: Agus, Emily; Hardwick, Jo Subject: RE: Gateway Energy Centre

Hi Jo,

It will just be yourself and I on the call tomorrow, so I will use the number you have provided below.

As a little bit of background I have attached a presentation which I will talk through tomorrow.

I would be particularly interested to know your thoughts etc on proposed approach, and the requirements for a full Flood Risk Assessment.

I look forward to speaking with you tomorrow.

Kind Regards, Emily.

From: Agus, Emily Sent: 30 March 2012 14:18 To: Hardwick, Jo Subject: RE: Gateway Energy Centre

Hi Jo,

I think it will be a conference call, but I'll confirm nearer the date.

Thanks, and speak soon.

Kind Regards, Emily.

From: Hardwick, Jo [mailto:jo.hardwick@environment-agency.gov.uk] Sent: 30 March 2012 13:28 To: Agus, Emily Subject: RE: Gateway Energy Centre

Hi Emily

That's fine. Will it just be you calling me, or is it a conference call?

You probably have my number already, but in case not – 01473 706016

Jo

From: Agus, Emily [<u>mailto:AgusE@pbworld.com</u>] Sent: 30 March 2012 11:34 To: Hardwick, Jo Subject: RE: Gateway Energy Centre

Hi Jo,

A call at 2pm on the 17<sup>th</sup> would work. Would this be suitable?

Kind Regards, Emily.

From: Hardwick, Jo [mailto:jo.hardwick@environment-agency.gov.uk] Sent: 30 March 2012 09:25 To: Agus, Emily Subject: RE: Gateway Energy Centre

### Hi Emily

That would be useful. 16th or 17th would be best for me, but I could also do 20th – anytime those days

Jo

From: Agus, Emily [<u>mailto:AgusE@pbworld.com</u>] Sent: 30 March 2012 08:49 To: Hardwick, Jo Subject: Gateway Energy Centre

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Jo,

InterGen is in the early stages of its electrical connection planning application for Gateway Energy Centre (we had an internal kick off meeting on Wednesday).

As part of the planning application process, we would like to arrange a call with you to give you a project update and take you through our intended approach and initial routing work? I would like to get your views on how we best progress matters, and what potential impacts may need assessment.

By way of brief update:

- Previously, the electrical connection was to involve a new substation being built by National Grid in the local area (floor area around 100m x 130m) near Mucking Flats. InterGen was then required to consent and construct an electrical connection from the proposed Gateway Energy Centre to the new substation. This could have meant new overhead lines or underground cable of upto 5km in the area.
- Following work with National Grid last year, we are now able to use the existing overhead lines which connect the existing Coryton Power Station to the main National Grid Rayleigh to Tilbury overhead lines. Consequently, we do not need new overhead lines or a long distance underground electrical cable and we do not need a new substation. All in all, good news.
- InterGen now needs to connect Gateway Energy Centre to the existing Coryton Power Station, and is intending to do this by means of an underground connection of roughly 700m.

Would you have availability for a call the week of 16 April?

Any queries please call me on the number below. I look forward to hearing from you.

Kind Regards, Emily.



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**RESPONSE FROM ESSEX COUNTY COUNCIL (CULTURAL HERITAGE / ARCHAEOLOGY)** 

From: Richard Havis at Place Services [mailto:Richard.Havis@essex.gov.uk] Sent: 23 April 2012 16:20 To: Van Looy, Morris Cc: Agus, Emily Subject: RE: Gateway Energy Centre - electrical connection

## Morris

Please find attached a letter from this office confirming that no archaeological work would be required on this connection route.

Richard

**Richard Havis** 

Senior Historic Environment Officer

Historic Environment Branch

Essex County Council| telephone: 01245 437632 extension: 51632

Mobile:07887 662168

| email: richard.havis@essex.gov.uk

# EssexWorks

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From: Van Looy, Morris [mailto:MVanlooy@INTERGEN.com] Sent: 19 April 2012 15:29 To: Richard Havis, Senior Consultant Historic Environment Cc: Agus, Emily (AgusE@pbworld.com) Subject: Gateway Energy Centre - electrical connection

Richard,

Many thanks for your time today. As discussed, I attach a copy of the presentation.

I look forward to receiving your letter and should you have any queries please contact me.

Regards, Morris UK Development Director InterGen (UK) Limited Dir tel: +44 (0) 131 624 6748 Mob: +44(0) 7771 813 830 <u>mvanlooy@intergen.com</u>

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Essex County Council Environment, Sustainability and Highways Place Services County Hall Chelmsford Essex CM1 1QH

Morris Van Looy UK Development Director InterGen (UK) Limited 21 Holburn Viaduct, London EC1A 2DY Our ref: Date: 23rd April 2012

Dear Morris

**Specialist Archaeological Advice** 

## **Re: Electrical Connection Gateway Energy Centre**

Thank you for consulting the Historic Environment Officer of Essex County Council on the proposed electrical connection scheme.

The Historic Environment Record and the work undertaken in the area of London Gateway by Oxford Archaeology have shown that the proposed connection route is unlikely to impact on any significant archaeological deposits. Therefore in the case of this proposed route this office would be happy for cultural heritage to be scoped out of the EIA for this element and that there would be no requirement for any archaeological condition on the planning consent.

Yours sincerely

7 Mains

Richard Havis Senior Historic Environment Officer

Telephone: 01245 437632 Email: richard.havis@essex.gov.uk

