PARSONS BRINCKERHOFF

PROGRESS POWER

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Progress Power Project Preliminary Environmental Information Report [PEIR]

Progress Power

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Final

Progress Power Project
Preliminary Environmental Information Report

Prepared for
Progress Power Limited
49 York Place
Edinburgh
EH1 3JD

Prepared by
Parsons Brinckerhoff
Amber Court
William Armstrong Drive
Newcastle upon Tyne
NE4 7YQ

www.pbworld.com

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LIST OF ABBREVIATIONS

ACC	Air Cooled Condenser
AES	Annual Energy Statement
AGI	Above Ground Installation
AQMAU	Air Quality Modelling and Assessment Unit
AQS	Air Quality Standards
BAT	Best Available Technique
BAP	Biodiversity Action Plan
BDC	Babergh District Council
BGS	British Geological Survey
BPD	Building Proximity Distance
CCGT	Combined Cycle Gas Turbine
CCR	Carbon Capture Readiness
CCS	Carbon Capture and Storage
CEMP	Construction Environmental Management Plan
CEMS	Constant Emissions Monitoring System
CHP	Combined Heat and Power
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CSM	Conceptual Site Model
DBA	Desk Based Assessment
DCS	Distributed Cooling System
DECC	Department for Energy and Climate Change
DEFRA	Department for Environment, Food & Rural Affairs
DCLG	Department of Communities and Local Government
DCO	Development Consent Order
DMP	Development Management Policies
DMRB	Design Manual for Road and Bridges
DPD	Development Plan Documents
DTM	Digital Terrain Mapping
EA	Environment Agency

EADF	Eye Airfield Development Framework
EC	European Community
ECIA	Ecological Impact Assessment
EfW	Energy from Waste
EIA	Environmental Impact Assessment
ELV	Emission Limit Value
EMR	Electricity Market Reform
EP	English Partnerships
EPA	Environmental Protection Act
EPR	Environmental Permitting Regulations
EPS	European Protected Species
ES	Environmental Statement
ESA	Environmentally Sensitive Area
EU	European Union
FRA	Flood Risk Assessment
GCN	Great Crested Newt
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GSPZ	Groundwater Source Protection Zone
GT	Gas Turbine
GTG	Gas Turbine Generator
HA	Highways Agency
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HRSG	Heat Recovery Steam Generator
HSE	Health and Safety Executive
HSI	Habitat Suitability Index
IAQM	Institute of Air Quality Management
IDB	Internal Drainage Board
IEA	Institute of Environmental Assessment
IED	Industrial Emissions Directive
IGE	Institute of Gas Engineers

IPC	Infrastructure Planning Commission (Now abolished and references to "IPC" should be read as "the Secretary of State", as appropriate).
IPPC	Integrated Pollution Prevention and Control
JNCC	Joint Nature Conservation Committee
Km	Kilometres
kV	Kilovolt
LCA	Landscape Character Assessment
LCAG	Landscape Character Assessment Guidance for England and Scotland
LCPD	Large Combustion Plant Directive
LDF	Local Development Framework
LoW	List of Waste
LTS	Local Transmission System
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
m	Metres
m^2	Metres Squared
mm	Millimetres
MOC	Minimum Offtake Connection
MSDC	Mid Suffolk District Council
MWe	Mega Watt Electrical
MWth	Mega Watt Thermal
NCA	National Character Area
NE	Natural England
NERC	Natural Environment and Rural Communities
NGC	National Grid Company
NGET	National Grid Electricity Transmission
NMR	National Monuments Record
NO_x	Nitrous Oxides
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRS	National Readership Survey

NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptor
NTS	National Gas Transmission System
NVC	National Vegetation Classification
NVZ	Nitrate Vulnerable Zone
OCGT	Open Cycle Gas Turbine
OEM	Original Equipment Manufacturers
OHL	Overhead Line
PA 2008	Planning Act 2008
PADHI	Planning Advice for Development near Hazardous Installations
PIG	Pipeline Inspection Gauge
PINS	The Planning Inspectorate
PPE	Personal Protective Equipment
PPV	Peak Particle Velocity
PPW	Planning Policy Wales
PRoW	Public Right of Way
PTF	Pig Trap Facility
RGE	Reciprocating Gas Engine
ROV	Remotely Operable Valve
SAC	Special Area of Conservation
SAM	Scheduled Ancient Monument
SCC	Suffolk County Council
SCGT	Simple Cycle Gas Turbine
SCR	Selective Catalytic Reduction
SEC	Sealing End Compound
SLA	Special Landscape Areas
SNC	South Norfolk Council
SNCI	Site of Nature Conservation Interest
SoCC	Statement of Community Consultation
SoS	Secretary of State
SO_x	Sulphur Oxides

SPA	Special Protection Area
SPV	Special Purpose Vehicle
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TA	Transport Assessment
TAN	Technical Advice Note
TP	Traffic Plan
UK	United Kingdom
UK-D	United Kingdom Distribution
UK-T	United Kingdom Transmission
USA	Updating and Screening Assessment
VDV	Vibration Dose Values
VER	Valued Ecological Receptors
WFD	Water Framework Directive
WFDTAG	Water Framework Directive Technical Advisory Group
WHO	World Health Organisation
WPL	Watt Power Limited
WSI	Written Scheme of Investigation
ZTV	Zone of Theoretical Visibility

SECTION 1

INTRODUCTION

1 INTRODUCTION

1.1 Overview

1.1.1 This document is the Preliminary Environmental Information Report (PEIR) for the Progress Power Project. It has been prepared by Parsons Brinckerhoff on behalf of Progress Power Limited (PPL).

1.1.2 PPL is promoting a new thermal generating station (hereafter referred to as the Power Generation Plant) on land at the former Eye Airfield located in Eye, Mid Suffolk, East Anglia, England, (approximate grid reference 613239 275109). The proposed Project Site is shown in Figure 1.1, being the current project red line boundary and which includes all options currently under consideration by PPL as explained in further detail in this PEIR.

1.1.3 The Power Generation Plant will operate as a Simple Cycle Gas Turbine (SCGT) plant and will be designed to provide an electrical output of up to 299 Megawatts (MW). The plant will be fuelled by natural gas, supplied to the site by a new gas pipeline connecting the Power Generation Plant to the existing National Gas Transmission System (NTS).

1.1.4 The Power Generation Plant will operate as a peaking plant, with maximum operational hours not exceeding 1500 hours per year, it will operate at times of peak demand when generation from renewable sources is reduced, and will be called upon by the National Grid to maintain capacity on the system.

1.1.5 The Power Generation Plant constitutes a Nationally Significant Infrastructure Project (NSIP) under the terms of the Planning Act 2008 (PA 2008) and therefore an application for a Development Consent Order (DCO) is proposed to be made to the Secretary of State (SoS) (the proposed DCO Application).

1.1.6 The four main elements of the proposed Progress Power Project would comprise:

- A new **Power Generation Plant**, a SCGT gas fired power generating station capable of providing up to 299 MW;
- A new electrical connection (referred to as the (**'Electrical Connection'**) to export electricity from the Power Generation Plant to the substation within the Electrical Connection Compound;
- A new electrical connection compound comprised of a new substation and sealing end compound (SEC), referred to as the

'**Electrical Connection Compound'** to export electricity from the Power Generation Plant to the National Grid; and

- A new gas pipeline connection (referred to as the **'Gas Connection'**) to bring natural gas to the Power Generation Plant from the NTS in the vicinity of the Project Site.

1.1.7 The proposed Power Generation Plant, Electrical Connection, Electrical Connection Compound and Gas Connection together with all access requirements are referred to as **the 'Project'** and are all integral to the generation of electricity and the subsequent export of that electricity to the National Grid. The proposed DCO Application will apply for a DCO in respect of the proposed Project.

1.2 Structure of the PEIR

1.2.1 This PEIR has been prepared in distinct sections to allow the reader to understand the proposed Project background, the purpose of the document, the regulatory framework in which the PEIR has been prepared, and the proposed methodology for undertaking the Environmental Impact Assessment (EIA).

1.2.2 The document is set out as follows:

- **Section 1** -comprises a description of the developer, a brief description of the proposed Project, an introduction to the consenting regime, the need for and benefits of the proposed Project, and the consultation strategy.
- **Section 2** -provides a brief description of the planning policy background and regulatory framework in which the PEIR has been prepared;
- **Section 3** -provides a description of the proposed Project site and the surrounding area and includes a more detailed project description of the Power Generation Plant, two options for the Gas Connection and two options for the Electrical Connection and Electrical Connection Compound.
- **Section 4** – provides a description of the methodology employed in undertaking the EIA for the proposed Project.
- **Section 5** -provides a description of project alternatives which have been considered.
- **Sections 6** to **15** -provide a description of the environmental assessment information which has been gathered to date, as well as details of the next steps required to complete the EIA process.

1.3 Application for an Order granting Development Consent

1.3.1 As the generation capacity of the Power Generation Plant will exceed 50 MW, development consent is required under the PA 2008.

1.3.2 Development consent for a NSIP (and associated development) may only be granted by a DCO through an application under Section 37 of the PA 2008 to the SoS. Section 37 of the PA 2008 also governs the content of an application for a DCO, including the requirements for the necessary accompanying documents. These requirements are specified in the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ("APFP Regulations").

1.3.3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (the EIA Regulations) require an EIA to be undertaken in respect of development that is classed as "EIA development". All development in Schedule 1 to the EIA Regulations ("Schedule 1 development") requires an EIA. Development in Schedule 2 to the EIA Regulations ("Schedule 2 development") requires an EIA if it is likely to have significant effects on the environment.

1.3.4 The definition of a Schedule 1 development includes thermal generating stations with a heat output of 300 MW or more (Schedule 1, paragraph 2(a)).

1.3.5 The thermal output of the Power Generation Plant will be greater than 300 MW and therefore an EIA will be required under the EIA regulations[1].

1.3.6 Section 5(2)(a) of the APFP Regulations, requires that any Environmental Statement (ES) required pursuant to the EIA Regulations, together with any scoping or screening opinions or directions, must accompany the proposed DCO Application.

1.4 Need for and Benefits of the Project

1.4.1 This section briefly summarises why the proposed Project is needed and how it would contribute towards ensuring greater reliability of electricity supply in the UK. A fuller need case will be presented within the proposed DCO Application.

[1] Thermal output is commonly defined as the amount of 'useable heat' which is produced as part of the process of the combustion of fuel. Only a part of this useable heat can be converted to electrical energy, which is why this is a larger value than electrical output.

1.4.2 Under Section 31 of the PA 2008 a DCO is required to authorise an NSIP. In England and Wales, an onshore electricity generating station is considered to be a NSIP if the generating capacity is greater than 50 MW. As the generation capacity of the Power Generation Plant will exceed this threshold, development consent is required. The determination of the DCO Application must have regard to, *inter alia*, any relevant National Policy Statements (NPSs) designated in respect of that type of infrastructure. Further explanation of the decision-making process under the PA 2008 is set out in Section 2.3 below.

1.4.3 The overarching NPS for Energy is NPS EN-1 which is one of the relevant NPSs for the proposed Project alongside NPSs EN-2, EN-3, and EN-5 (see Chapter 2). EN-1 sets out national policy for energy infrastructure and explains the need for such infrastructure.

1.4.4 NPS EN-1 re-affirms the transitional role of new gas generation, confirms that a diverse energy mix is required and that there is a significant need for new energy generation infrastructure to replace capacity that will be lost through the closure of existing large plant. Indeed it states that the decision-maker 'should start with a presumption in favour of granting consent to applications for energy NSIPs' (paragraph 4.1.2).

1.4.5 NPS EN-1 therefore establishes the general need case for energy NSIPs, including gas generation. This has been preceded and followed by other Government policy and evidence, some of which is summarised below to provide further context.

1.4.6 Paragraph 3.6.1 of NPS EN-1 confirms that gas generation will play an important role in the UK's energy mix, "Fossil fuel power stations play a vital role in providing reliable electricity supplies: they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix. They will continue to play an important role in our energy mix as the UK makes the transition to a low carbon economy..."

1.4.7 Section 3.7 of NPS EN-1 describes the need for new domestic electricity network infrastructure. It states that "....there is an urgent need for new electricity transmission and distribution infrastructure...to be provided. The SoS should consider that the need for any given proposed new connection or reinforcement has been demonstrated if it represents an efficient and economical means of connecting a new generating station to the transmission or distribution network, or reinforcing the network to ensure that it is sufficiently resilient and has sufficient capacity (in the light of any performance standards set by Ofgem) to supply current or anticipated future levels of demand" (Paragraph 3.7.10).

1.4.8 To ensure that there is reliability of supply, it is Government policy that the electricity generation mix needs to incorporate a balance of technologies that continuously and reliably produce stable and controllable power and that within this scenario, gas-fuelled electricity generating technologies can play a significant role. Thus in the second Annual Energy Statement (AES) (November, 2011) (the Strategy), the Department of Energy and Climate Change (DECC) directed the need to build new power generation infrastructure. In line with this requirement, DECC acknowledged the need for gas to continue to feature strongly in the energy mix, and also stated that while it is important that businesses play their part in the transition to a low-carbon economy, it is also important to remain competitive.

1.4.9 These statements are supported by the more recent Gas Generation Strategy, released by DECC in December 2012[2]. The Strategy sets out the important role that gas generation—as a reliable, flexible source of electricity—will play in any future generation mix, supporting a secure, low-carbon and affordable electricity system. It states that "Gas currently forms an integral part of the UK's generation mix and is a reliable, flexible source of electricity. Using gas as a fuel in our power stations currently provides a significant proportion of our electricity generation (around 40% in 2011)".

1.4.10 Moreover, the Strategy suggests that there could be as much as 26 gigawatts (GW) of new gas generation infrastructure required if the decarbonisation target is set at 200g/CO_2/kWh. The Strategy also indicates that in 2030 we could need more overall gas capacity than we have today, although operating at lower load factors. The modelling shows that gas could play a more extensive role, with higher load factors, should the 4th Carbon Budget be revised upwards (Executive Summary).

1.4.11 The Strategy also presents another scenario which indicates that up to 41 GW of new gas generation capacity will be needed by 2030 to underpin long term electricity supplies and provide back-up to nuclear and wind generation at times of peak demand.

1.4.12 In October 2012, Ofgem (the electricity and gas regulatory body) prepared a report entitled 'Electricity Capacity Assessment' which was submitted to the SoS. This estimates a set of plausible electricity supply and demand forecasts that could exist over the next four years and the associated risks to security of supply.

1.4.13 One of the key findings of the Ofgem report is that electricity supply will decrease significantly from the current historically high levels. This is

[2] http://www.decc.gov.uk/en/content/cms/meeting_energy/oil_gas/gasgenstrat/gasgenstrat.aspx#

primarily because of a significant reduction in electricity supplies from coal and oil plants, which are due to close under European environmental legislation. An updated Electricity Capacity Assessment report issued by Ofgem in June 2013 has indicted that the risks to electricity security of supply over the next six winters have increased since the report in October 2012.

1.4.14 With the large number of wind turbines that are now providing electricity to the National Grid and the increasing number of solar farms being proposed, both of which represent an intermittent power supply, there is also significant consideration being given to the need for flexible power on the network. Parsons Brinckerhoff's "Powering the Future" report[3] which maps the route to a low carbon economy, has predicted that up to 9,000 MW of flexible power would be needed by 2050 to help stabilise the National Grid due the intermittent supply, in particular from offshore wind.

1.4.15 Given the above, there is therefore a clear and significant requirement for further capacity to meet the projected need for both base load (i.e. continuously operational) and reactive/flexible generation. A dedicated gas fired peaking plant at the Power Generation Plant site could allow for the rapid provision of reserve capacity to the National Grid thus playing a role in meeting the future energy requirements of the UK.

1.5 The Developer

1.5.1 The Developer of the proposed Project is PPL.

1.5.2 PPL is the Special Purpose Vehicle (SPV) which has been set up to develop the proposed Project and has been established by Watt Power Limited (WPL). WPL has been established to develop flexible gas fired generation assets to support the UK Government's drive to a low carbon economy. WPL is resourced through Stag Energy, a company founded in 2002. The Stag Energy management team has created and delivered over 10,000 MW of power generation and related infrastructure projects across the globe, of which 2,500 MW was delivered in the UK.

1.5.3 Similarly, Stag Energy provides resources to Gateway Storage Company Ltd which is developing an offshore salt cavern gas storage facility in the East Irish Sea. The project has been consented by the UK Government and the local planning authority (Barrow-in-Furness Borough Council, Cumbria) (for further information on the project visit: www.gatewaystorage.co.uk).

[3] Powering the Future, Mapping our low carbon path to 2050, Parsons Brinckerhoff, 2010

1.5.4 WPL and PPL are committed to the development of assets to support the UK Government's drive to a low carbon economy. WPL and PPL recognise the need to balance commercial benefits with the environmental issues and concerns of energy projects and believe this can be responsibly delivered at a local level.

1.5.5 PPL is also committed to acting in a socially and environmentally responsible manner. As part of this policy, PPL will seek the views of the local community and have regard to them in preparing the proposed DCO Application. The proposed Project and supporting infrastructure will be designed and developed to the highest quality, safety and environmental standards.

1.5.6 For further details on PPL, please visit: www.progresspower.co.uk or www.wattpowerltd.co.uk

1.6 Purpose of this Document

Preliminary Environmental Information

1.6.1 As explained in section 1.3, the proposed Project is an EIA development under the EIA Regulations. As a result, PPL is carrying out an EIA of the proposed Project. Under Regulation 10(b) of the EIA Regulations, PPL must consult on preliminary environmental information relating to the proposed Project. That information has been compiled into this PEIR. The PEIR presents the environmental information and assessments which have been completed to date.

The Consultation Process

1.6.2 This PEIR has been compiled to enable PPL to consult upon the proposed DCO Application in advance of submitting an application by providing up-to-date information about the proposed Project. This pre-application consultation is a requirement under section 47 of the PA 2008. This PEIR has been published in the manner described in PPL's Statement of Community Consultation (SoCC), which explains how PPL proposes to consult those living in the vicinity about the proposed Project. The SoCC explains how feedback can be given about the proposed Project and the content of this PEIR.

1.6.3 This PEIR is intended to provide an assessment, on a preliminary basis, of the likely significant environmental impacts of the proposed Project. The proposed DCO Application is still being developed and refined. In particular, decisions are still to be made on the two route corridor options for the Gas Connection, the two options for the Electrical Connection Compound and the Electrical Connection, as well as the layout of the Power Generation Plant within that part of the

proposed Project site allocated for the location of the Power Generation Plant. The current iteration of the proposed Project is described in Section 4 below. Any feedback received during the consultation process will help inform the development of the proposed Project and the decisions still to be made.

1.6.4 This preliminary environmental information will be developed further in light of the consultation responses received and the methodologies proposed herein as part of the EIA process. The results of the EIA will ultimately be presented in an Environmental Statement (ES) that will accompany the proposed DCO Application.

1.6.5 Before undertaking the EIA for the Project, PPL requested a Scoping Opinion from the SoS. This request was made in May 2013, and was by a Scoping Report entitled 'Progress Power Project Environmental Impact Assessment Scoping Report'. The Scoping Report described is available on the Progress Power web site and describes the key anticipated environmental issues that would require detailed evaluation as part of the EIA process and the methodologies proposed to assess these impacts.

1.6.6 A Scoping Opinion was subsequently issued by the SoS, and this is available on request or from the Planning Inspectorate web site. The EIA process and this PEIR take the Scoping Opinion and other consultation responses provided to SoS into account.

1.6.7 In preparing this document regard has been had to advice and good practice such as:

- Planning Inspectorate - Advice note three: EIA consultation and notification - Republished July 2013 (version 5)
- Planning Inspectorate - Advice note seven: Screening, Scoping and Preliminary Environmental Information, - Republished July 2013 (version 4)
- Guidance and professional bodies' guidance relevant to specific environmental topics, as described in each topic Section in this PEIR.

SECTION 2

REGULATORY AND POLICY BACKGROUND

2 REGULATORY AND POLICY BACKGROUND

2.1 Introduction

2.1.1 This section of the PEIR outlines the main regulatory and policy framework that is relevant to the proposed Project.

2.1.2 Relevant EU directives are considered first, at a high level.

2.1.3 This section also gives an overview of the current and emerging policies relevant to the proposed Project at the national, regional and local levels as they relate to the consideration of the likely scope of EIA.

2.1.4 Further description of the planning policy background and its relevance to the proposed Project will be provided in the Planning Statement, which will be produced as a separate document to support the proposed DCO Application. A summary of relevant and important planning policy will also be presented more fully within the ES.

2.2 European Union (EU)

2.2.1 Current EU directives of particular relevance to the proposed Project with respect to environmental requirements are as follows:

Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the EIA Directive)

2.2.2 The EIA Directive ensures that plans, programmes and projects likely to have significant effects on the environment are made subject to an environmental assessment, prior to their approval or authorisation. The Directive sets the thresholds for projects that require an EIA (as stated in Section 1.3 and also outlines the impacts on the environment to be assessed in the EIA process. This Directive is implemented in the respect of NSIPs in the UK by the EIA Regulations.

Directive 2003/35/EC of 26 May 2003 (the Public Participation Directive).

2.2.3 The Public Participation Directive implements the obligations arising from the Århus Convention and amends the EIA Directive and the Integrated Pollution Prevention and Control (IPPC) Directive (see 2.2.4 below) to improve public participation.

Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (the Industrial Emissions Directive (IED))

2.2.4 In December 2010 the EU adopted a Proposal for a Directive on industrial emissions (IED). The IED recasts seven existing directives related to industrial emissions, in particular Directive 2008/1/EC of 15 January 2008 concerning integrated pollution prevention and control (the IPPC Directive) and Directive 2001/80/EC of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants (the Large Combustion Plant Directive (LCPD)), into a single legislative instrument to improve the permitting, compliance and enforcement regimes adopted by Member States. However, the general principles of the IPPC Directive and the LCPD Directive described below are retained and will remain relevant to the proposed Project.

2.2.5 The purpose of the IPPC Directive was to achieve integrated prevention and control of pollution arising from certain potentially polluting processes and to ensure a high level of protection for the environment taken as a whole. Measures were laid down to prevent or, where that is not practicable, to reduce emissions in the air, water and land with the introduction of emission limit values (ELV) and best available techniques (BAT). With regard to power projects, combustion installations with a rated thermal input exceeding 50 MW are subject to the IPPC Directive. The IPPC Directive is transposed into UK legislation via the Environmental Permitting (England and Wales) Regulations 2010 (as amended) and the IED is to be transposed through amendments to the Environmental Permitting (England and Wales) Regulations 2010. An Environmental Permit will be required for the operation of the Power Generation Plant.

2.2.6 The purpose of the LCPD was to limit the emissions of certain pollutants into the atmosphere from large combustion processes. The LCPD applied to combustion plants with a rated thermal input equal to or greater than 50 MW. The emissions of nitrogen oxides (NOx), sulphur dioxide (SO_2) and particulates were subject to the stringent ELVs stipulated in the LCPD. The LCPD requirements for new plant are implemented in the UK regulations by the Environmental Permitting (England and Wales) Regulations 2010.

Directive 1992/43/EEC of 21 May 1992 on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive)

2.2.7 The aim of the Habitats Directive is to contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora. Measures taken pursuant to this Directive by the Member

States are designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of community interest whilst also taking into account economic, social and cultural requirements, and regional and local characteristics. The Conservation of Habitats and Species Regulations 2010 implement the Habitats Directive in England and Wales.

Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (the Birds Directive)

2.2.8 The Birds Directive provides a comprehensive scheme for the protection of wild bird species naturally occurring within the EU. The Directive places great emphasis on the protection of habitats suitable for supporting endangered and migratory species, introducing a system of Special Protection Area designation to protect important habitats. The Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species Regulations 2010 implement the requirements of the Birds Directive in England and Wales.

Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe (the Ambient Air Quality Directive)

2.2.9 Council Directive 96/62/EC on ambient air quality assessment and management (the Air Quality Framework Directive) described the basic principles of how air quality should be assessed and managed in the Member States. Subsequent 'Daughter Directives' introduced numerical limits, thresholds and monitoring requirements for a variety of pollutants including oxides of nitrogen and sulphur dioxide to guarantee that there are no adverse effects with regard to human health. The Air Quality Standards Regulations 2010 give effect, in England and Wales, to the Ambient Air Quality Directive.

2.3 Overview of Decision Making under the Planning Act 2008 and Policy Context

2.3.1 The Power Generation Plant is categorised as a NSIP and therefore falls to be determined by the SoS under the regime established by the PA 2008.

2.3.2 Section 104 of the PA 2008 provides that in making decisions on DCO Applications, the SoS must have regard to any relevant NPS and must decide applications in accordance with it unless the adverse impacts of the proposal would outweigh its benefits (or in certain other limited circumstances). The SoS must also have regard to any local impact report and any other matters which the SoS 'thinks are both important and relevant to its decision' (paragraph 1.1.1). These matters may

include the Development Plan Documents or other documents in the Local Development Framework.

2.3.3 NPS EN-1 (Overarching National Policy Statement for Energy), states 'this NPS, when combined with the relevant technology-specific energy NPS, provides the primary basis for decisions' (paragraph 1.1.1) and the decision-maker 'should start with a presumption in favour of granting consent to applications for energy NSIPs' (paragraph 4.1.2). The PA 2008 makes no reference to the Development Plan, in contrast to the regime established for non NSIP projects under the Town and Country Planning Act 1990 Indeed, as stated in (NPS EN-1, paragraph 4.1.5) and referred to in reports by the examination panels to the Secretaries of State for recent DCO examinations, in the event of a conflict between policies contained in any other documents (including development plan documents) and those contained in an NPS, those in the NPS prevail for the purposes of decision making on NSIPs.

2.3.4 The proposed DCO Application will be examined by SoS, either by a single commissioner or a panel, which will submit a report containing a recommended decision to the SoS who takes the final decision as to whether to grant a DCO for the proposed Project.

2.4 National Policy Statements

2.4.1 The PA 2008 required new policy to inform decisions on NSIPs in England and Wales. Policy for such infrastructure is set out in NPSs. The NPSs which are relevant to the consideration of this proposed DCO Application are:

- The Overarching National Policy Statement for Energy (NPS EN-1);
- The National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (NPS EN-2);
- NPS EN-4 National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines; and
- NPS EN-5 National Policy Statement for Electricity Networks Infrastructure.

2.4.2 It is noted that the Gas Connection is below the relevant size thresholds to be categorised as a NSIP itself, whilst the Electrical Connection, being underground, does not fall within the PA 2008. However, given the integral nature of these components, together with the Electrical Connection Compound, they will form part of the proposed DCO Application. Accordingly, NPSs EN-4 and EN-5 are likely to be important and relevant in the determination of the proposed DCO Application in respect of these components.

2.4.3 The main provisions of these NPSs are set out below. Policies and assessment criteria pertaining to particular environmental topics are set out in the relevant topic sections elsewhere in this PEIR.

2.4.4 NPS EN-1 contains Government policy on energy and energy infrastructure development, representing the needs case for any proposal for an energy NSIP.

2.4.5 NPS EN-2 supplements EN-1 in providing specific Government policy on fossil fuel generating station NSIPs such as the proposed Project.

2.4.6 NPS EN-1 recognises that there is a significant need for new energy infrastructure. It states that pending plant closures in the UK will reduce available capacity by 22 GW by 2020 as a result of tightening environmental legislation and older power stations approaching the end of their useful life (paragraphs 3.3.7 to 3.3.9).

2.4.7 Paragraph 4.1.9 of EN-1 seeks that the information provided in the application demonstrates that the financial viability and technical feasibility of the proposal has been properly assessed. Accordingly, further information will be provided within the ES and other documents submitted with the DCO Application.

2.4.8 NPS EN-1 also sets out guidance on the consideration of alternatives when developing a new energy generation project (paragraphs 4.4.2-4.4.3) and guidance relating to criteria for 'good design' of new developments (Section 4.5).

2.4.9 Specific guidance on good design is also provided in NPS EN-2, including that "applicants should demonstrate good design particularly in respect of landscape and visual amenity (…) and in the design of the project to mitigate impacts such as noise and vibration, transport impacts and air emissions" (paragraph 2.3.16)

2.4.10 In Section 4.6 of EN-1 the consideration of Combined Heat and Power (CHP) is denoted as an assessment principle in itself and references to other guidance and viability considerations are set out. It is stated that applicants should consider CHP from the earliest point and it should be a criterion for site selection (paragraph 4.6.7).

2.4.11 Section 4.8 of NPS EN-1 also sets out how applicants and the SoS should take the effects of climate change into account when developing and consenting NSIPs. Paragraph 4.8.11 requires any adaptation measures to be based on the latest set of UK Climate Projections, the Government's latest UK Climate Change Risk Assessment (when available) and in consultation with the Environment Agency (EA).

2.4.12 Other assessment principles that are particularly likely to be relevant to energy NSIPs are set out as follows in EN-1 (relevant paragraph numbers given in brackets):

- Pollution control (4.10): describes the relationship with other regimes (e.g. Environmental Permitting) which is essentially that the decision maker should be satisfied that "potential releases can be adequately regulated under the pollution control framework" without unacceptable cumulative impacts arising.
- Safety (4.11) and Hazardous Substances (4.12): describes the relationship with other regimes and the general requirement that the decision maker will need to be satisfied that they are complied with.
- Health (4.13): requires that an assessment of potential health impacts is made in relation to each element of the project, such as in relation to air quality, waste or noise and describing the relationship with other regimes, stating at 4.13.5 that where separate air quality regulations are (or will be) satisfied then the decision maker is likely to consider these effective mitigation, whereas for noise or other aspects it will take account of health concerns when setting requirements.
- Nuisance and amenity (4.14): the relationship with common law nuisance, statutory nuisance, and the importance to be attached by the SoS to their consideration during the determination process, are set out.
- Security (4.15): Government policy is set out as being "to ensure that, where possible, proportionate protective security measures are designed into new infrastructure projects at an early stage in the project development" with documentary requirements and relationships to other guidance set out.

2.4.13 As well as generic assessment principles, EN-1 also identifies a generic list of impacts which could arise from an energy NSIP and the criteria by which they should be assessed. These specific topics include ecology, landscape, noise and socio-economics. These topics are discussed in more detail when describing the preliminary assessment of impacts presented in this PEIR.

2.4.14 NPS EN-2 outlines considerations and factors relating to site selection and design for developers for fossil fuel generating stations, although it states that these concerns must be considered by the applicant, and that: "…the Government does not seek to direct applicants to particular sites for fossil fuel generating stations" (paragraph 2.2.1). NPS EN-2 sets out a number of specific impacts that could arise from a fossil fuel generating NSIP and criteria by which they should be assessed. These

specific topics include air quality, landscape and visual, noise and vibration, and water quality and resources. These topics are discussed in more detail when describing the preliminary assessment of impacts in this PEIR.

2.4.15 NPS EN-4 sets Government policy on the relevant considerations and factors that should be taken into account as to route selection for developers for, inter alia, gas pipeline NSIPs. The NPS sets out a number of impacts that could arise from such development and criteria by which they should be assessed. These specific topics include biodiversity, noise and vibration, soil and geology, and water quality and resources. These topics have been discussed in more detail when describing the preliminary assessment of impacts in this PEIR.

2.4.16 NPS EN-5 provides the primary basis for decisions taken by SoS on applications it receives for electricity network NSIPs, including the relevant considerations and factors that should be taken into account related to route selection. The NPS sets out a number of impacts that could arise from such development and criteria by which they should be assessed. These specific topics include biodiversity and geological conservation, landscape and visual, noise and vibration, and Electric and Magnetic Fields. These topics have been discussed in more detail when describing the preliminary assessment of impacts in this PEIR.

2.5 National Planning Policy Framework for England (NPPF) - 2012

2.5.1 The National Planning Policy Framework (NPPF) sets out the Government's approach to planning in England and how local authorities are expected to apply this. The NPPF may, potentially, be considered important and relevant by the SoS in determining an application for a DCO.

2.5.2 The NPPF sets sustainable development at its core, stating that the policies set in paragraphs 18-219, taken as a whole, constitute the Government's view of what sustainable development in England means in practice for the planning system.

2.5.3 The NPPF focuses its interpretation of sustainable development into three dimensions: economic, social and environmental.

2.5.4 A set of 12 'Core planning principles' are set out in the NPPF. Paragraph 17 states that planning should "support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change, and encourage the reuse of existing resources, including conversion of existing buildings, and encourage the use of renewable resources (for example, by the development of renewable energy)."

2.5.5 As part of delivering sustainable development, the NPPF presents 13 different thematic titles setting out distinct ways in which Government expects the operation of planning processes at the local level to achieve the 12 core land use planning principles. The most relevant of these 13 titles to this development have been listed below:

- Building a strong, competitive economy (1)
- Supporting a prosperous rural economy (3)
- Promoting sustainable transport (4)
- Requiring good design (7)
- Promoting healthy communities (8)
- Meeting the challenge of climate change, flooding and coastal change (10)
- Conserving and enhancing the natural environment (11)
- Conserving and enhancing the historic environment (12)

2.6 Local Planning Policy

Mid Suffolk District Council Local Development Framework (LDF)

2.6.2 The LDF is a portfolio created by Mid Suffolk District Council (MSDC) that contains the local planning documents for the District. Of the documents contained in this portfolio, the most relevant are the Development Plan Documents (DPDs) including the Core Strategy DPD which provide formal, adopted objectives and policies that will be used to guide future development in the District over the plan period.

Core Strategy DPD[4] [5]

2.6.3 The Mid Suffolk Core Strategy DPD was adopted in September 2008. This document is the key DPD and "sets out the vision, objectives, spatial strategy and core policies that will guide development across the district until 2025 and beyond". The Core Strategy and other LDF documents are key components in the delivery of the Community Strategy (2004) for the District, particularly those elements that relate to the development and use of land. Following a review carried out in late 2012, the adopted Core Strategy DPD should be read in conjunction with the 'Core Strategy Focused Review' (December 2012).

[4] http://www.midsuffolk.gov.uk/assets/UploadsMSDC/Economy/Strategic-Planning-Policy/LDF/Adopted-Core-Strategy/Core-Strategy-with-CSFR-label-and-insert-sheet-07-01

[5] http://www.midsuffolk.gov.uk/assets/UploadsMSDC/Economy/Strategic-Planning-Policy/LDF/Core-Strategy-FR/CSFR-adopted-December-2012.pdf

2.6.4 The 'Overall Spatial Vision' of the Core Strategy DPD states: "By 2021 the East of England will be realising its economic potential and providing a high quality of life for its people, including by meeting their housing needs in sustainable inclusive communities. At the same time it will reduce its impact on climate change and the environment, including through savings in energy and water use and by strengthening its stock of environmental assets".

2.6.5 The following objectives of the Core Strategy DPD may be of relevance and importance to the consideration of impacts of the proposed Project:

- Core Strategy Objective SO 1 – To protect, manage, enhance and restore the landscape, biodiversity and geodiversity of the District.
- Core Strategy Objective SO 2 – To seek to improve water quality and reduce pollution to the wider environment.
- Core Strategy Objective SO 3 – To respond to the possible harm caused by climate change Mid Suffolk will seek to minimise its carbon footprint, by encouraging a shift to more sustainable travel patterns. In particular the Council will address congestion and pollution and ensure that all new development minimises its carbon emissions and carbon consumption and is adapted to future climate change.
- Core Strategy Objective SO 4 – To protect, manage, enhance and restore the historic heritage / environment and the unique character and identity of the towns and villages by ensuring that new developments are appropriate in terms of scale and location in the context of settlement form and character.
- Core Strategy Objective SO 5 – Reinforce the vitality and viability of local shops, schools, services, recreating and community facilities in towns and key service centres and primary villages.
- Core Strategy Objectives SO 6 - Provision of housing, employment, retail, infrastructure and access to services will be coordinated to enable communities to be balanced, inclusive and prosperous.
- Core Strategy Objective SO 7 – To support sustainable communities by locating development where it will enable people to access jobs and key services, such as education, health, recreation and other facilities recognising and respecting the diversity in the function and character of Mid Suffolk's towns, key service centres and primary and secondary villages and countryside.
- Core Strategy Objective SO 11 – To support the growth of the local economy and rural regeneration in ways which are compatible with environmental objectives, and which deliver increased prosperity for the whole community.

2.6.6 Discussion of Core Strategy Strategic Policies shall be found in the relevant Section of this PEIR.

Suffolk County Waste Core Strategy Development Plan Document (2011)

2.6.7 The former Eye Airfield has been identified as one of three areas of search for a Strategic Residual Waste Treatment Facility under Policy WCS4 of the Waste Core Strategy DPD. The area of search is large, at 81.35 ha, of which it is stated 5 ha would be needed for the facility, in addition to access arrangements. The Waste Core Strategy Policy WDM1 "Safeguarding of Waste Management Sites" states "This safeguarding is not intended to preclude other forms of development within the Area of Search which do not prejudice or would not be prejudiced by a strategic residual waste treatment facility" (paragraph 7.2).

Saved Local Plan policies and emerging Development Management Policies

2.6.8 The Development Management Policies (DMP) have yet to be developed by the Council. Development was put on hold due to other LDF commitments and changes in staff resources.

2.6.9 In the meantime a number of Saved Policies of the MSDC Local Plan (1998) continue to be used for determining planning applications until replaced by Development Management / site allocations DPDs. Those of potential relevance to the proposed Project include Policies E2 (Industrial uses on allocated sites) and E3 (Warehousing, storage, distribution, and haulage depots). It should be borne in mind that paragraphs 214-215 of the NPPF (2012) require that pre-Planning and Compulsory Purchase Act 2004 local planning policies possess weight only insofar as they accord with the NPPF.

2.6.10 It is understood that when finalised and adopted, the DMP will set out the proposed approach and detailed policies for controlling development and delivering the vision, objectives and core policies in the Core Strategy. As such, it will play a role in determining planning applications at the local level, and in the case of NSIPs may inform assessments of potential impacts. Work is ongoing on developing joint DMP between Babergh District Council (BDC) and MSDC.

Eye Airfield Development Framework (February 2013 Approved Version) (EADF)

2.6.11 The former Eye Airfield is a broad location for growth in Mid Suffolk as identified by Mid Suffolk's Core Strategy (2008) and the Eye Airfield

Development Framework (EADF) provides an assessment of current uses and attempts to identify future proposed uses through a master planning approach. This framework has no planning status but at the Environment Policy Panel in February 2013 elected Members unanimously supported the Development Framework as a basis for the future development of the site and MSDC is identifying the most appropriate planning process to deliver the framework's principles.

2.6.12 The EADF has been informed by various stages of consultation with local businesses, land owners, stakeholders and residents. A number of aspirations were identified during consultation including:

- development that is sustainable and landscape led;
- the creation of on-site energy generation opportunities for new business;
- a focus on improving skills for young people, including establishing links to local secondary schools.

2.6.13 The centre of the site has been proposed for energy producing developments, which should be "appropriate provided they meet environmental criteria that ensure a good quality of life for all around them" (page 17).

2.7 Other Relevant Policy and Guidance

2.7.1 The following are considered to be potentially relevant policy and guidance in considering the potential impact of the proposed Project:

- The Electricity Market Reform (2012);
- Natural Environment White Paper (2012);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (2011);
- The UK Climate Change Risk Assessment (CCRA) (2012);
- Gas Generation Strategy (2012); and
- Suffolk Growth Strategy (2013).

The Electricity Market Reform (2012)

2.7.2 The Electricity Market Reform (EMR) has been developed to meet three main objectives:

- Ensuring the future security of electricity supplies;
- Driving the decarbonisation of electricity generation; and

- Minimising costs to consumers.

2.7.3 These measures are designed to provide both technical and economic encouragement for an increase in the development of low carbon technologies.

2.7.4 In terms of the proposed Project, one of the most relevant aims of the EMR is to provide ".... a mechanism to support security of supply, if needed, in the form of a Capacity Market" (paragraph 23).

2.7.5 Although the EMR focuses heavily on the need for decarbonisation, there is also a strong focus on the need for security of supply and a mix of energy generation technologies on line at any one time. The EMR also recognises that gas fired power generation will continue to play a crucial role in the UK energy mix going forward.

2.7.6 The Energy Bill will be the primary piece of legislation to come about as a result of the EMR although it is currently at Committee Stage in the House of Commons. The Energy Bill seeks to enact the key drivers that are necessary to achieve the recommendations set out in the EMR.

Natural Environment White Paper (2012)

2.7.7 This document outlines the Government's vision for the natural environment over the next 50 years. The paper makes the case that a healthy, properly functioning natural environment is the foundation of sustained economic growth, prospering communities and personal wellbeing.

2.7.8 The paper focuses on protecting and improving the UK's natural environment, encouraging a green economy, the importance of reconnecting with people and nature and refers to international and EU leadership on these matters.

Biodiversity 2020: A strategy for England's wildlife and ecosystem services

2.7.9 This document builds on the Natural Environment White Paper for England and provides a comprehensive picture of how England is implementing local, international and EU commitments. It sets out the strategic direction for biodiversity policy for the next decade on land, rivers, lakes and the sea.

The UK Climate Change Risk Assessment (2012)

2.7.10 This report sets out the main priorities for adaptation in the UK under a number of key themes identified in the Climate Change Risk Assessment 2012 (CCRA), including; infrastructure, business, natural

environment and industry. It describes the policy context, and measures already in place to tackle some of the risks in each area. It highlights the constraints of the CCRA analysis and provides advice on how to take account of the uncertainty within the analysis.

Gas Generation Strategy (2012)

2.7.11 The Gas Generation Strategy sets out the Government's view on the need for gas energy generation and how the UK will address barriers to help build investor confidence and encourage the new capacity that the Government will need over the coming years. It sets out the required work to maintain gas supply security and ensure that the best use of this natural resource is implemented.

Suffolk Growth Strategy (2013)

2.7.12 The Suffolk Growth Strategy seeks to help develop a "coordinated economic strategy which sets out how Suffolk will create more, higher value, high skill jobs and increase wealth across the county".

2.7.13 The Strategy also analyses strengths and weaknesses of the Suffolk economy, places a spotlight on the challenges and opportunities ahead and defines how the county, district and borough councils will work together with local partners to create the right conditions for business growth.

2.7.14 The Strategy identifies the Energy Industry as a key area for growth and job production.

SECTION 3

ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

3 ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

3.1 Content of the Preliminary Environmental Information Report

3.1.1 As explained in Section 1, this PEIR is required under Regulation 10(b) of the EIA Regulations, which has been prepared to accompany the consultation process, as detailed in the SoCC.

3.1.2 As also explained in Section 1, the proposed DCO Application will be accompanied by an ES. The information required to be included in the ES is set out in Part 1 of Schedule 4 to the EIA Regulations. This PIER contains such of this information as has been compiled by PPL and which is reasonably required to preliminary assess the environmental effects of the proposed Project.

3.1.3 The PEIR presents the available environmental information in respect of the proposed Project at the time of writing, based on up-to-date desk top studies, field surveys and assessments. Where additional information or studies are required in order to complete assessment of the environmental impacts for the ES, this has been highlighted within this document. Details are also provided as to the additional research and assessments required to comprehensively gauge the environmental impact of the proposed Project.

3.1.4 Table 3.1 presents the information requirements and indicates where the information requirements for the ES have been considered in the different sections of this PEIR.

Table 3.1 - Information for Inclusion in Environmental Statement

	Required Information		PEIR Reference
	PART 1		
Relevant paragraph number of Schedule 4 to the EIA Regulations	17	A description of the development, including in particular: A description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases; A description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; An estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc) resulting from the operation of the proposed development.	Section 4 and Sections 6 to 15
	18	An outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects.	Section 5
	19	A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.	Sections 6 to 15

	20	A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from: The existence of the development; The use of natural resources; The emissions of pollutants, the creation of nuisances and the elimination of waste, And the description by the applicant of the forecasting methods used to assess the effects on the environment.	Sections 6 to 15
	21	A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	Sections 6 to 15
	22	A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	Non-Technical Summary
	23	An indication of any difficulties (technical deficiencies of lack of know-how) encountered by the applicant in compiling the required information.	Sections 6 to 15

3.1.5 This PEIR identifies some likely approaches to mitigation measures which are envisaged to avoid, reduce and, if possible, remedy any significant adverse impacts identified. For impacts that cannot be entirely remedied, this PEIR identifies the likely residual adverse impacts once the mitigation is considered. This PEIR is issued in the context of a consultation undertaken in accordance with Chapter 2 of Part 5 to the PA 2008. As such, it is intended that mitigation will be further developed as a result of the consultation exercise and remain to be confirmed in the ES that will accompany the proposed DCO Application.

3.1.6 In due course, the information in this PEIR will be updated through the consultation and the continuing work indicated, as is necessary, to allow for preparation and finalisation of a comprehensive ES that will accompany the proposed DCO Application in respect of the proposed Project.

3.2 Methodology of the Environmental Impact Assessment

3.2.1 In accordance with the PA 2008 and the EIA Regulations, the EIA process for the Project includes the following:

- Establishing, through consultation, the Scope of the EIA including obtaining a Scoping Opinion from the SoS;
- Consideration of any potential technical and environmental alternatives;
- Establishing a comprehensive understanding of the existing baseline environmental conditions for the site and the relevant study areas for each topic;
- Identifying the potential environmental impacts resulting from the Project;
- Determining how the potential environmental impacts can be avoided, reduced or off-set through informed design and / or further mitigation and how its benefits may be enhanced;
- Assessing the significance of the potential environmental impacts in conjunction with other impacts arising from the Project and those from other neighbouring developments and / or sources (in-combination and cumulative impacts); and
- Proposing options as to how any significant residual impacts will be mitigated, managed and monitored.

3.2.2 A brief description of these steps is provided here.

Establishing the Scope of the Environmental Impact Assessment

3.2.3 Under Section 42 ('Duty to Consult') of the PA 2008, there is a duty placed on developers to consult certain prescribed bodies as well as local communities. In this respect, PPL had initial discussions with MSDC to discuss the proposed Project in 2012 and held a scoping session with consultees including MSDC, SCC, the EA and Natural England (NE) in May 2013. PPL has subsequently, supplied documents for review / comment by MSDC and SCC in May 2013. PPL is continuing to consult with both Councils and other interested parties throughout all phases of the proposed Project.

3.2.4 Before commencing the EIA, PPL requested a Scoping Opinion from the SoS in May 2013. The request was supported by a Scoping Report that described the key anticipated environmental issues that would require detailed evaluation as part of the EIA process. The formal Scoping Opinion was received in June 2013, and has allowed for

agreement on the likely significant environmental impacts of the proposed Project and, therefore, the methodology of the EIA.

Establishment of the Project Scenario for Assessment

3.2.5 The proposed Project Scoping Report, submitted to the SoS in May 2013 set out a number of potential development alternatives to generate up to 299 MW at the former Eye Airfield within the Project Site. These development alternatives have now been refined since issue of the Scoping Report (see Section 5 of this PEIR). As explained in Section 5, SCGT has been identified as the preferred and most appropriate technology. There are several options of SCGT plant available to generate up to 299 MW. These different options mainly relate to the number of gas turbine generator (GTG) units used at the site. Each gas turbine generator unit consists of one or two gas turbines venting to a single flue. As described in Section 4, it is possible that only one unit of 299 MW is used. Alternatively, it may be that up to five units each of circa 59 MW are used. The proposed DCO Application will be flexible enough to allow PPL to achieve a 299 MW project by building between one to five gas turbine generators. For the reasons explained in section 5, it will not be possible to make a decision on this in advance of submitting the proposed DCO Application.

3.2.6 It should be noted that the other supporting infrastructure at the Power Generation Plant site including water tanks, administration building, stores, electricity switchyard, gas receiving station, and gatehouse will remain constant, no matter how many units are used.

3.2.7 Both Gas Connection route corridor options and both Electrical Connection Compound options and Electrical Connection route corridor options are considered in this PEIR. A decision on the preferred option for each will be made before submission of the proposed DCO Application and the preferred option will be assessed in the ES.

3.2.8 As stated in Section 4 of this PEIR, air quality modelling has indicated that a minimum stack height of 20 m would be required for adequate dispersion of exhaust gases and to meet legislative air quality targets i.e. IED. Taking into consideration potential differences in technology available from different Original Equipment Manufacturers (OEMs), the requirement to fit constant emissions monitoring systems (CEMS) and silencers into the stack(s), it is envisaged that the maximum height of stack(s) at the Power Generation Plant will be 30 m. This height applies to all technology choices and is not dependent on the number of units present at the site. Therefore if one gas turbine generator is used, one stack of up to 30 m would be required and if five gas turbine generators are used, five stacks of up to 30 m each would be required.

3.2.9 In accordance with SoS Advice Note 9 (Rochdale Envelope), rather than assess every possible iteration for the Power Generation Plant, the assessments in this PEIR (and the ES when it is prepared) are based on an assessment of the realistic 'worst case' scenario from within the proposed Project parameters.

3.2.10 Taking the above into consideration, it has been determined that for the majority of topic areas to be addressed in the EIA, a realistic 'worst case' scenario from the perspective of environmental impacts in respect of the Power Generation Plant would be five gas turbine generator units, each with its own 30 m high stack. This is a significant reduction in height from the previously published worst case scenario of up to 5 stacks at 90 m as set out in the Scoping Report. Each assessment topic chapter will contain an assessment of which scenario is the worst case to confirm (or otherwise) the assumption that the five unit reference scenario is the realistic worst case.

3.2.11 Where this reference case is not deemed as 'worst case', both the reference case and the impact specific worst case will be assessed. This will ensure that the reference case is assessed across all disciplines to ensure there is one full assessment of a realistic and buildable scenario.

3.2.12 The assessment is based on the continuous operation of the Power Generation Plant. This is an appropriate basis for the assessment because the pattern of any intermittent operation cannot be predicted with certainty. The actual intermittent operation of a peaking plant could give rise to more significant effects than continuous operation for noise. as such this affect has been considered in the noise section.

Measurement and Establishment of Environmental Baseline

3.2.13 In undertaking an EIA for any project it is important to identify the environmental baseline for the potential receptors in the vicinity of the development location. This allows the impacts of the proposed Project to be compared and / or combined with the existing quality of the environment in order to ensure an informed assessment of the potential impacts and to allow the identification of the most appropriate mitigation which could be employed to minimise any adverse impacts.

3.2.14 To establish the baseline, a study area that is appropriate for each assessment topic is identified. Next, a range of environmental data is gathered from a combination of sources in respect of the study area. This has included:

- Documentary information on the Power Generation Plant site, Gas Connection and Electrical Connection route corridors, and their

surroundings within each relevant study area, including information available from the previous environmental impact assessment work for other projects;

- Field survey information, including: Phase 2 ecological surveys; landscape character assessments; background noise levels; ground conditions / contaminated land assessments, location of sensitive receptors and traffic levels on the road network; and
- Data held by both statutory and non-statutory consultees.

3.3 Description of the Proposed Development and Identification of Potential Impacts

3.3.1 A full description of the Project, site and surroundings is provided in Section 4. The environmental topics to be assessed and reported are:

- Air Quality and Emissions – Section 6;
- Noise and Vibration – Section 7;
- Ecology – Section 8;
- Water Quality and Resources – Section 9;
- Geology, Ground Conditions and Agriculture – Section 10;
- Landscape and Visual Impact – Section 11;
- Waste Management and Health – Section 12;
- Traffic, Transport and Access – Section 13;
- Cultural Heritage and Archaeology – Section 14;
- Socio-Economics – Section 15; and
- Cumulative Impacts – Section 16

Evaluation and Quantification of Potential Impacts

3.3.2 To help evaluate and quantify the likely significant environmental effects of the proposed Project, environmental significance criteria will be employed to ensure that the identified impacts are fully understood. Effects may be positive (i.e. beneficial) or negative (i.e. adverse).

3.3.3 Environmental significance criteria are important as they will help inform the determination by the competent authority of the overall acceptability of the proposed Project. An understanding of the significance criteria for all assessed impacts will be an important and relevant consideration in the determination of the application for a DCO in respect of the proposed Project.

3.3.4 The significance of environmental effects resulting from the construction, operation and decommissioning of the proposed Project will generally be presented in this PEIR and the final ES using a series of matrices. These will be developed to describe the sensitivity of receptors which have the potential to be impacted by the development and the magnitude of any impacts which are likely to arise. The magnitude of impact and sensitivity of receptor will be cross referenced to give an overall significance of effect for any potential impact. Where it is not possible to quantify impacts, a precautionary qualitative assessment will be carried out, based on available knowledge and professional judgement.

3.3.5 The operational life of the proposed Power Generation Plant is approximately 25 years, following which the decommissioning phase will take place. Given the longevity of the proposed Project, assumptions have been made based on current knowledge of decommissioning practices of plants of this type.

3.3.6 In order to provide a consistent approach and enable comparison of impacts upon different environmental components, the assessments generally follow the structure and use the terminology outlined below in Table 3.2 - Table 3.4. However, it is noted here that for some impact sections, significance criteria may need to differ depending on the conditions encountered at the Project Site. The criteria will therefore be subject to further discussion with statutory consultees. Each technical chapter of the ES will clearly identify and explain any specific criteria used. Unless otherwise stated, effects of moderate significance or above are considered to be significant for the purposes of the EIA Regulations.

3.3.7 Two broad types of potential mitigation measures will be described in the ES: embedded mitigation namely design / standard control measures, which will be used to produce an initial assessment of impact; and further specific mitigation which will be required, which may be introduced where appropriate and taken into account in the assessment of residual impacts.

Table 3.2 - Determining Receptor Sensitivity

Sensitivity	*Example*
Very High	Internationally designated site (e.g. Ramsar / SPA / World Heritage Site.
High	Nationally designated site (SSSI), / designated Landscape (e.g. National Park) / principal aquifer / main watercourse / human health.
Medium	Regionally designated ecology / heritage site / secondary aquifer / minor watercourse
Low (or lower)	Locally designated ecology / heritage site; area of hardstanding / brownfield land / industrial site / low ecological value.
Negligible	Negligible ecological value.

Table 3.3 - Determining Magnitude of Impact

Magnitude		*Example*
Major	Adverse	A permanent or long term adverse impact on the integrity and value of an environmental attribute or receptor
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Adverse	An adverse impact on the integrity and/or value of an environmental attribute or receptor, but recovery is possible in the medium term and no permanent impacts are predicted.
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of attribute quality.

Minor	Adverse	An adverse impact on the value of an environmental attribute or receptor, but recovery is expected in the short- term and there would be no impact on its integrity.
	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on attribute or a reduction in the risk of a negative impact occurring.
Negligible	Adverse	Very minor loss
	Beneficial	Very minor benefit
No Change		No change would be perceptible, either positive or negative.

Table 3.4 - Determining Significance of Effect

		Magnitude of Impact				
		No Change	***Negligible***	***Minor***	***Moderate***	***Major***
Receptor Sensitivity	***Very High***	Neutral	Slight	Moderate	Large	Very Large
	High	Neutral	Slight	Moderate	Large	Large
	Medium	Neutral	Slight	Slight	Moderate	Large
	Low	Neutral	Slight	Slight	Slight	Moderate
	Negligible	Neutral	Neutral	Neutral	Neutral	Neutral

3.4 Mitigation and Monitoring

3.4.1 Full consideration has been given to the potential mitigation measures which could be used to ensure that any potentially adverse significant environmental impact of the development of the proposed Project is minimised.

3.4.2 In the hierarchy of mitigation likely significant adverse effects should, in the first instance, be avoided altogether; where this is not possible such effects should then be reduced and, finally, off-set.

3.4.3 Significant adverse effects are best avoided by incorporating appropriate measures during the detailed design process. As such, the iterative nature of the EIA can help to inform the development of the final design of the proposed Project.

3.4.4 The proposed Project has and will continue to be developed in such a way that the reduction and, wherever possible, elimination of any associated significant adverse environmental impacts are integral to the overall design philosophy.

3.4.5 Where it is not possible to avoid adverse significant environmental effects, potential mitigation and monitoring measures will be discussed in each assessment chapter. The full monitoring programme can only be established following the completion of the EIA process.

Indirect / Secondary and Cumulative Impacts

3.4.6 Indirect and secondary impacts are those which arise as a result of a direct / primary impact. For example, deterioration of water quality in a watercourse due to an effluent discharge (which would be a direct impact) could have an indirect / secondary impact on aquatic biodiversity. Cumulative impacts occur when a receptor is subject to multiple impacts. Indirect / secondary impacts are discussed in each of the individual technical sections. A preliminary discussion of cumulative impacts is provided in Section 16 of this PEIR.

3.4.7 The ES that will accompany the proposed DCO Application for the Project will include discussions of the potential inter-relationships between effects as a result of the construction, operation and decommissioning of the proposed Project.

3.5 Presentation of the Environmental Impact Assessment in this Document

3.5.1 Sections 6 to 15 present the preliminary findings from assessments carried out to date of the likely environmental impacts associated with the development of the proposed Project. These assessments are not final and are still ongoing. Final assessments will be presented within the ES that is submitted as part of the proposed DCO Application. Each Section of this PEIR concerns a specific environmental topic and has been broken down to include a number of sub-sections. Typically, these are:

- Introduction
- Legislative and Policy Context
- Project Scenario for Assessment

- Assessment Methodology and Significance Criteria
- Embedded Design Mitigation
- Consultation
- Baseline Conditions and Receptors
- Preliminary Assessment of Potential Impacts
  - Power Generation Plant
  - Gas Connection Route Corridor Option 1
  - Gas Connection Route Corridor Option 2
  - Electrical Connection Compound and Electrical Connection Option 1
  - Electrical Connection Compound and Electrical Connection Option 2
- Potential Mitigation / Management Techniques
- Preliminary Assessment of Residual Impacts
- Next Steps

3.5.2 Each of these elements is discussed below.

Introduction

3.5.3 This sub-section will provide details of the key issues with regard to the specific environmental topic and impacts being considered.

Legislative and Policy Context

3.5.4 This sub-section will address relevant legislation and policy in respect of the topic under consideration, insofar as not already addressed in Section 2.

Project Scenario for Assessment

3.5.5 This sub-section will describe the realistic 'worst case' Power Generation Plant scenario for the topic being assessed from within the proposed Project parameters described in Section 4. If the realistic worst case scenario for a topic is anything other than the maximum 5 gas turbine generator scenario, the 5 unit scenario will be assessed as well.

3.5.6 Both options for the Gas Connection and Electrical Connection Compound together with the Electrical Connection are assessed in each technical section.

Assessment Methodology and Significance Criteria

3.5.7 This sub-section will provide details of the assessment methodology adopted for the purposes of the EIA, insofar as it differs from that set out in this Section 3. The assessment methodology chosen reflects the relevant guidelines and legislative standards. In addition, significance criteria to be used to quantify the extent of the environmental impact of the proposed Project will be identified and related to the generic criteria set out above in Tables 3.2 - 3.4.

Embedded Design Mitigation

3.5.8 This sub-section will provide details of mitigation measures embedded into the design of the proposed Project which are relevant to the topic being assessed.

Consultation

3.5.9 This sub-section provides a list of the consultation responses to the Scoping Report received to date and sets out how PPL has or intends to respond to these comments.

Baseline Conditions and Receptors

3.5.10 This sub-section will identify the study area for each specific impact topic and will describe and discuss the environmental baseline conditions, and provide, as appropriate, justification for the selection of receptors to be considered within the analysis of the impact of the proposed Project.

Preliminary Assessment of Potential Impacts

3.5.11 This sub-section will discuss the preliminary findings of the EIA studies. In undertaking this assessment both quantitative and qualitative evaluations are necessary, in varying degrees, depending on the nature of the environmental impact being assessed. The assessments will consider the three phases of the proposed Project; Construction, Operation and Decommissioning. The significance of the environmental impacts identified, where it can be identified at this preliminary stage, is addressed as appropriate with reference to the significance criteria established.

Potential Mitigation / Management Techniques

3.5.12 This sub-section will provide details of the emerging mitigation measures that are proposed to ensure that any potential adverse environmental impacts are either minimised or, wherever possible, avoided altogether. Where relevant, monitoring may be identified to

allow it to be demonstrated that the mitigation measures employed are effective.

Preliminary Assessment of Residual Impacts

3.5.13 This sub-section will assess the significance of the environmental impacts following the application of any identified mitigation measures.

Next Steps

3.5.14 Given that this is a preliminary assessment of the environmental effects of the proposed Project, ongoing assessment work is being carried out. Each Technical Section will identify this work.

3.5.15 Section 16 discusses the preliminary cumulative impacts associated with the development of the proposed Project.

SECTION 4

PROJECT AND SITE DESCRIPTION

4 PROJECT AND SITE DESCRIPTION

4.1 Overview of the Proposed Project

4.1.1 The proposed Project consists of four main elements: the Power Generation Plant, the Gas Connection the Electrical Connection and the Electrical Connection Compound.

4.1.2 The Power Generation Plant would be situated on land within the former Eye Airfield, approximately 1 km north west of Eye Town Centre, 1.3 km west of Langdon Green, approximately 1.5 km east of Yaxley, in Mid Suffolk, and 4 km south of Diss in South Norfolk. The approximate Grid Reference of the Power Generation Plant site is TM 132 750. The Power Generation Plant would be located on land which makes up part of the former World War 2 airfield but has, to the applicant's knowledge, remained in agricultural use.

4.1.3 The location of the proposed Project Site is shown in Figure 1.1. The Power Generation Plant site, which is within the proposed Project Site, covers an area of approximately 10 ha. However, the footprint of the Power Generation Plant would be smaller than the full Power Generation Plant site. Figure 4.1 contains an indicative position of the Power Generator Plant within this part of the proposed Project Site. This position of the Power Generation Plant within the Power Generation Plant site is subject to consultation and will be refined prior to submission of the proposed DCO Application.

4.1.4 Construction of the Power Generation Plant and connections would require temporary areas for each project element for equipment / material laydown which will allow for the storage of construction materials and provide an area for the assembly of large plant items within a reasonable distance of the construction site. Although the exact arrangement of the Power Generation Plant is still to be finalised, it is known that there is sufficient space within the identified Power Generation Plant site boundary to facilitate the laydown area (Figure 4.1).

4.1.5 The Gas Connection would run from the Power Generation Plant into Feeder 5 on the NTS. At present, the route of the gas pipeline has not been confirmed, it will either run west into the National Grid Compressor Station, or in a southerly direction, for an approximate length of 1.5 km. These two options are shown in Figure 1.1 and described in detail below.

4.1.6 The Electrical Connection would consist of a new underground cable which would connect the Power Generation Plant into the existing

400 kV electrical infrastructure via a new substation within the Electrical Connection Compound to be located adjacent to the existing line. The exact position of the Electrical Connection Compound is still to be defined, and two options are presented in Figure 1.1.

4.1.7 Figure 4.1 shows a potential plant layout and likely maximum extent of the Power Generation Plant, whilst Figure 1.1 shows the two potential Gas Connection options, the two Electrical Connection Compound options and the two Electrical Connection route corridor options. The Electrical Connection Compound, the Electrical Connection and the Gas Connection will be refined to a single preferred option prior to submission of the proposed DCO Application.

4.2 Site and Surroundings

4.2.1 The Power Generation Plant would be sited within a 10 ha plot of land located within the former Eye Airfield. The former Eye Airfield accommodates several industrial parks, including: Brome Industrial Estate (to the north), Eye Airfield Industrial Estate (to the north-east), Mid Suffolk Business Park (to the east) and Oaksmere Business Park (to the west). The site is located within a larger triangular area directly to the east of the former 'main runway' and north of the former SW-NE runway.

4.2.2 The proposed Project is entirely within the administrative boundary of MSDC, a constituent part of the County of Suffolk. The District Council area includes Stowmarket Urban District, Gipping Rural District, Hartismere Rural District and Thedwastre Rural District. These areas comprise a mixture of urban, semi-urban and rural communities, with the nearest population centre being Eye 1 km to the south (population 1,716: 2001 Census).

4.2.3 The Power Generation Plant site and immediate surrounding area is characterised by the remnants of the airfield, including the runway and the access roads. Buildings that once formed part of the airfield have been replaced by units accommodating various industrial activities including a power generation facility (the 12.7 MW Eye Chicken Litter Power Plant) and a National Grid Gas Compressor Station. Additionally, there are two large (130 m high) wind turbines (Roy Humphrey Group wind farm) within 200 m to the north west of the proposed Power Generation Plant site. Two more wind turbines have received planning permission and these will be constructed to the south of the site at Baldwin Farm.

4.2.4 The proposed Project site is comprised of agricultural land surrounded by a belt of trees to the east, over which lies the National Grid

Compressor Station, and is classed as Previously Developed Land within CS11.

4.2.5 The Power Generation Plant site is accessed from a private road to the south, Potash Lane, which in turn connects to Castleton Way, via the former main runway. Castleton Way provides connectivity to either from the B1077 to the east and the A140 to the west. The A140 is the main road between Norwich and Ipswich (each some 30 km away) and provides onward connectivity to the A14, about 20 km to the south. The A140 runs approximately 360 m north from the site boundary at its closest point. The closest point of the B1077 to the site is approximately 460 m east.

4.2.6 The road network in the vicinity of the Power Generation Plant site can be seen in Figure 1.1.

4.2.7 The Broads ESA (Environmentally Sensitive Area) is located to the north and east of the proposed Project. To the north, the ESA is approximately 2.7 km from the perimeter of the Power Generation Plant site, while it lies approximately 1.1 km from the site's eastern edge. Burgate ancient and semi-natural woodland is located approximately 5.5 km west of the proposed Power Generation Plant site. The Pennings Local Nature Reserve is located approximately 2.3 km to the south east.

4.2.8 The closest residential receptors include;

- (R1) Residential properties located to the east, north of Eye and adjacent to the B1077 (≈ 480 m from the closest point of the site);
- (R2) Residential properties located to the south west of the site adjacent to Old Norwich road (≈ 700 m from the closest point of the site);
- (R3) Farm located to the north west of the site (approximately 810 m from the closest point of the site); and
- (R4) Houses and static holiday homes to the north of the site, adjacent to the B1077 (≈ 750 m from the closest point of the site).

4.2.9 The land within the former Eye Airfield has been designated as a Strategic Site for development by MSDC. As stated earlier in Section 2.6, a draft Framework for the future Development of Eye Airfield has been produced (the EADF). The EADF includes an indicative masterplan for the Airfield and has been developed following stakeholder engagement at various stages during its production. The EADF seeks to encourage residential, business, energy production/waste management, 'common'/open spaces, recreational, allotment and agricultural developments.

4.3 Relevant Planning History

4.3.1 Up until World War 2, the area which makes up the Eye Industrial Estate was primarily used for agricultural purposes, before it was acquired by the American Air force as a base for B-17 Flying Fortresses and B-24 Liberators that flew bombing missions over Northern France in 1944.

4.3.2 Following the war, the estate was returned to agricultural use, although the runways and some other infrastructure remained.

4.3.3 Further development was relatively slow, until the construction of a number of industrial units to the north of the Airfield in the 1980s.

4.3.4 Since that time, the surrounding industrial estate has grown steadily with the addition of numerous industrial units and warehouses, the chicken litter fired power station and most recently, the erection of the two wind turbines.

4.3.5 The Power Generation Plant site, Gas Connection route corridor options, the two Electrical Connection Compound options and the Electrical Connection route corridor options have remained primarily agricultural throughout this time and to the present day. This may in part be related to constraints imposed on structures and land uses in the central part of the airfield due to the Gas Compressor Station and NTS gas pipeline, and their associated PADHI (planning advice for development near hazardous installations) zones. These planning constraints are described further in the EADF.

4.4 Detailed Description of Power Generation Plant and Generating Technology

4.4.1 The Power Generation Plant will be designed to provide a total output of up to 299 MW at rated site conditions, and will be fired on natural gas.

4.4.2 Previous consultation (i.e. the ‘Progress Power Project Scoping Report (issued to SoS in May 2013)) identified four potential technology choices for the Power Generation Plant; Combined Cycle Gas Turbine (CCGT); SCGT and Reciprocating Gas Engines (RGE). The potential for utilising CHP opportunities at the site using these technologies was also discussed. Since the Scoping Report was issued, a number of further studies have been undertaken to refine the technology choice. The outcome of these studies has determined that an SCGT plant is the most suitable technology choice for a peaking plant generating up to 299 MW.

4.4.3 The results of these studies and the design evolution of the Project are presented in more detail in Section 5 of this PEIR.

4.4.4 SCGT plants are considered the most appropriate technology choice for peaking plants for a number of reasons:

- Fast start-up – They can be operational and generating electricity within 10 – 15 minutes of being called upon, thus providing a very rapid response to changes in electricity demand.
- This cold start capability means that the turbines do not need to be running unnecessarily (idling) in anticipation of being required and as such reduce the amount of gas used.

4.4.5 The main generating equipment in a SCGT plant comprises gas turbine generators (GTGs). Each GTG consists of an inlet air filter, an air compressor, combustion chamber, power turbine, generator and exhaust silencer. Air will be compressed in the compressor of the Gas Turbine(s) (GT) and gaseous fuel injected into the combustion chamber(s) where the fuel will burn producing hot, high-pressure gases. These gases will expand across the rotor blades GT(s), which will drive both the compressor and the electrical generator(s). The hot exhaust gases are then routed directly to the stack and emitted to the atmosphere. The stack contains a silencer to reduce noise pollution.

4.4.6 SCGT plants usually use aero-derivative GTs (i.e. turbines derived from the aeronautical industry), primarily because of their suitability to frequent start-ups, flexibility, high efficiency and high-availability maintenance options. To achieve 299 MW, PPL envisages using 3, 4 or 5 individual aero-derivative GTGs.

4.4.7 However, ‘industrial’ type units can also be used which are typically larger and often more suited to longer operational hours. They offer more efficiency but less flexibility. Industrial gas turbines differ from aeronautical designs in that the frames, bearings, and blading are of heavier construction. To achieve 299 MW, PPL would likely use 1 or 2 individual industrial GTGs.

4.4.8 As stated in Section 1, the Power Generation Plant will be designed to operate as a ‘peaking’ or flexible plant. This means that the Power Generation Plant will operate up to 1500 hours per annum and only be used when it is required to even out the electricity grid, e.g. when there is a surge in demand for electricity associated with a particular event (e.g. where many people across the country boil kettles following the end of a popular television programme) or where there is a sudden drop in power being generated from plant which are constantly operational (e.g. a sudden outage).

Peaking Plant

4.4.9 Peaking plants help to 'balance out' the grid at times of peak electricity demand and also help to support the grid at times when other technologies (e.g. wind and solar plant) cannot generate electricity due to the weather conditions. Typically, peaking plants do not operate for long periods of time or very often. However when they do operate, they are nevertheless vital in 'evening out' the power in the grid. It is estimated that the Power Generation Plant at Eye would operate for a maximum of 1500 hours per year (approximately 17% of the time).

Emissions and Stack

4.4.10 The exhaust gasses and waste heat produced as part of the combustion process will be discharged to the atmosphere by stacks. Typically, each GTG unit would have its own dedicated stack. However, if the chosen configuration contains two separate turbines connected to one generator, the exhaust stacks from these individual turbines may be combined into one.

4.4.11 The GTs will be equipped with emissions control abatement, which limits the production of NOx to a maximum of 50 mg/Nm^3. Whether by water injection or dry low emission combustors, these techniques represent BAT for limiting emissions of NOx to atmosphere from GTs without the addition of chemical solutions, such as selective catalytic reduction using ammonia.

4.4.12 A stack height sensitivity study examined differing stack heights in 10 m intervals from 20 m to 80 m (inclusive). The stack height sensitivity considered long term and short term contributions to ground level concentrations of NO_2.

4.4.13 Stack emissions will be continuously recorded to ensure correct and efficient operation of the plant. Any significant deviations will be alarmed and corrections carried out on occurrence. Records will be maintained of performance and deviation. Full facilities for interfacing information, control and alarm systems will be installed so that the plant can be operated from the central control room via the distributed control system (DCS). In the event of a fault in the GT(s) or other major plant items the Power Generation Plant will shut down automatically in a controlled manner.

4.4.14 Natural gas sourced from the NTS (where sulphur content in the gas is generally negligible) is a clean burning fuel and does not produce the particulate or sulphur emissions associated with burning coal; consequently flue gas cleaning equipment is not required.

4.4.15 Further discussion of emissions control is provided in Section 6 of this PEIR which sets out the environmental assessments undertaken to date relating to Air Quality.

4.4.16 The maximum dimensions of each stack will be up to 30 m in height and up to 10 m in diameter. Each proposed stack would be a minimum of 20 m high and 4 m diameter.

Cooling

4.4.17 Since no cooling is required for the condensing of steam, the cooling requirements of SCGT plants are significantly lower than, for example, CCGT plants. The auxiliary cooling requirements (for lubrication oil, etc.) would be met via dry air cooling through the use of fin-fan coolers.

Maintenance

4.4.18 Sufficient spares will be held on site to ensure reliable operation of the plant. Materials and finishes will be selected to meet this objective and to ensure that the appearance of the Power Generation Plant does not deteriorate with time. Periodic and routine maintenance will take place on average once every six months, to ensure optimal operation at all times.

Other Miscellaneous Buildings

4.4.19 In addition to the main GTG units at the Power Generation Plant site, the following will also be present:

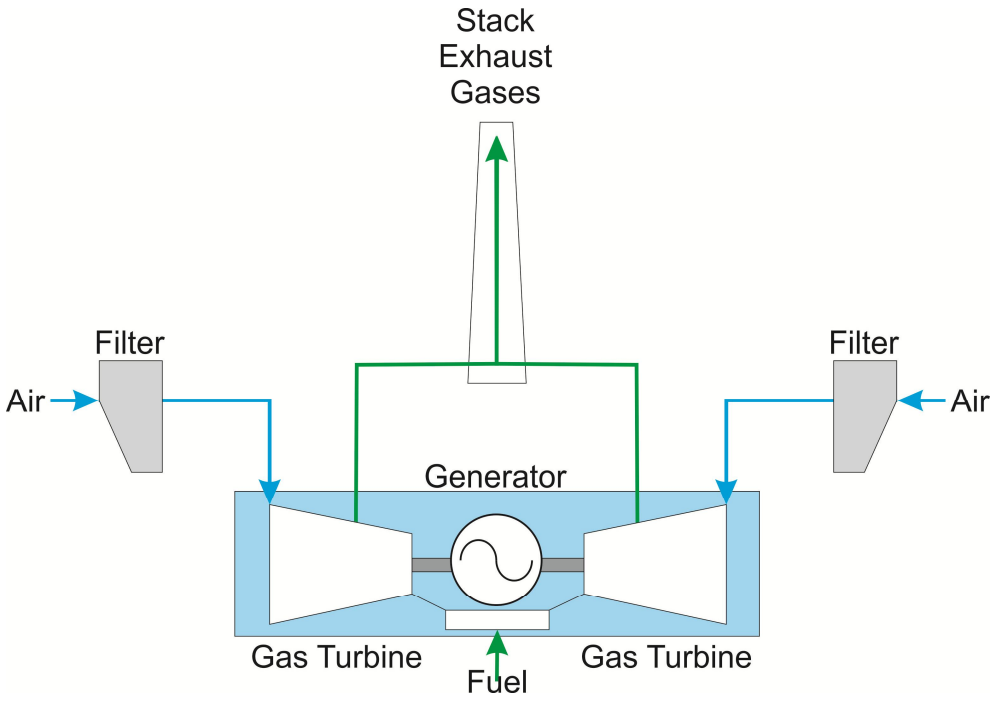
- **Process Water Tank -** In order to supply make up water to the plant.
- **Fire Water Tank -** The fire water storage tank will be designed to comply with the relevant fire regulations and will be installed together with fire pumps, hose reels, fire hydrants and portable extinguishers.
- **Control Building** – Required in order to monitor the plant operation and house plant controls.
- **Workshop and Stores Building** - To store certain strategic and routine maintenance spares and to provide a facility for carrying out minor maintenance of the plant. .
- **A Gatehouse –** Needed to provide security and maintain a log of site attendance, deliveries etc;
- **A Switchyard** would be required to connect the electrical infrastructure from the Power Generation Plant to transformers before export to the National Grid; and

- **A Gas Receiving Installation** would be required to process gas coming from the NTS to feed into the Power Generation plant site at the right flow and pressure conditions.

4.4.20 Figure 4.1 shows a possible layout of the proposed Project.

4.4.21 Insert 4.1 shows a simple schematic of SCGT operation.

Insert 4.1- A simple schematic of SCGT Gas Turbine Generator



4.4.22 Table 4.1 provides indicative dimensions for the main plant items which would be present at the Power Generation Plant site, as well as the other components of the proposed Project (being the Gas Connection and Electrical Connection Compound).

Table 4.1 - Indicative dimensions of main plant items

Plant Item		Minimum Dimensions(m)	Maximum Dimensions (m)
Stacks (Dimension)		20 (height) 4 (diameter)	30 (height) 10 (diameter)
Stacks (number)		1	5
Gas Turbine (Industrial)		32 (length) x 12 (width) x 16 (height)	35 (length) x 15 (width) x 20 (height)
Gas turbine (Aero)		20 (length) x 8 (width) x 9 (height)	30 (length) x 10 (width) x 12 (height)
Water tanks		10 (diameter) x 10 (height) for each tank. Maximum of 3 tanks.	10 (diameter) x 10 (height) for each tank. Maximum of 3 tanks.
Administration / workshop / control building		40 (length) x 10 (width) x 5 (height)	40 (length) x 10 (width) x 15 (height)
Gas receiving station including PTF		30 (width) x 30 (length) x 10 (height)	30 (width) x 30 (length) x 10 (height)
Electrical Connection Compound	Substation	150 (length) x 150 (width) x 12.5 (height)	150 (length) x 150 (width) x 12.5 (height)
	SEC	45 (length) x 22 (width) x 12.5 (height)	45 (length) x 22 (width) x 12.5 (height)

4.5 Gas Connection

4.5.1 A new gas pipeline will be required to connect the Power Generation Plant to the NTS in order to provide a reliable supply of fuel.

4.5.2 The UK National Grid Gas system is split into two parts, the NTS and the LTS (Local Transmission System).

4.5.3 The NTS represents the infrastructure designed to transmit gas large distances around the country, these are generally large diameter pipelines (> 24"/600mm) operating at high pressure (~70barg). The NTS is the backbone of the UK gas infrastructure and as such does not reach all points of mainland Britain; the load driven extremities are covered by the LTS.

4.5.4 A Gas Connection Feasibility study was undertaken for the proposed Project in July 2013. The purpose of the study was to define and evaluate the options available for connecting the Power Generation Plant to a suitable source of fuel gas, and provide a recommendation on the most appropriate option for this connection.

4.5.5 Preliminary pipeline calculations were performed, including Maximum Operating Pressure of the system, Maximum Incidental Pressure, Pipe Nominal Diameter, Design Factor, Wall Thickness, Minimum Building Proximity Distance and Area Classification;

4.5.6 A Crossing / Risk Register has been prepared for each potential corridor routeing. A Level 1 Route Study has been performed for this report, which has analysed a specified relevant area of interest for archaeological, natural and built environment issues having regard to considerations raised in NPS EN-4.

4.5.7 Previous consultation documents (e.g. 'Progress Power Project Scoping Report (issued to SoS in May 2013)) identified seven possible connection points as being potentially suitable locations to connect into the NTS infrastructure. All seven options connect to Feeder 5, a 600 mm high pressure steel pipeline (known as the Yelverton to Stowmarket Pipeline) that passes approximately 200 m east of the Power Generation Plant site. No suitable connections were identified to the LTS.

4.5.8 Since the Scoping Report was issued, a number of further studies have been undertaken to refine the route corridor choice. The outcome of these studies is that there are now two remaining potential options to connect into the NTS and two potential suitable route corridors.

4.5.9 The refinement studies are outlined in more detail in Section 5 of this PEIR.

4.5.10 The Location of Feeder 5 and the two possible remaining connection options are shown below in Insert 4.2 and 4.3 below.

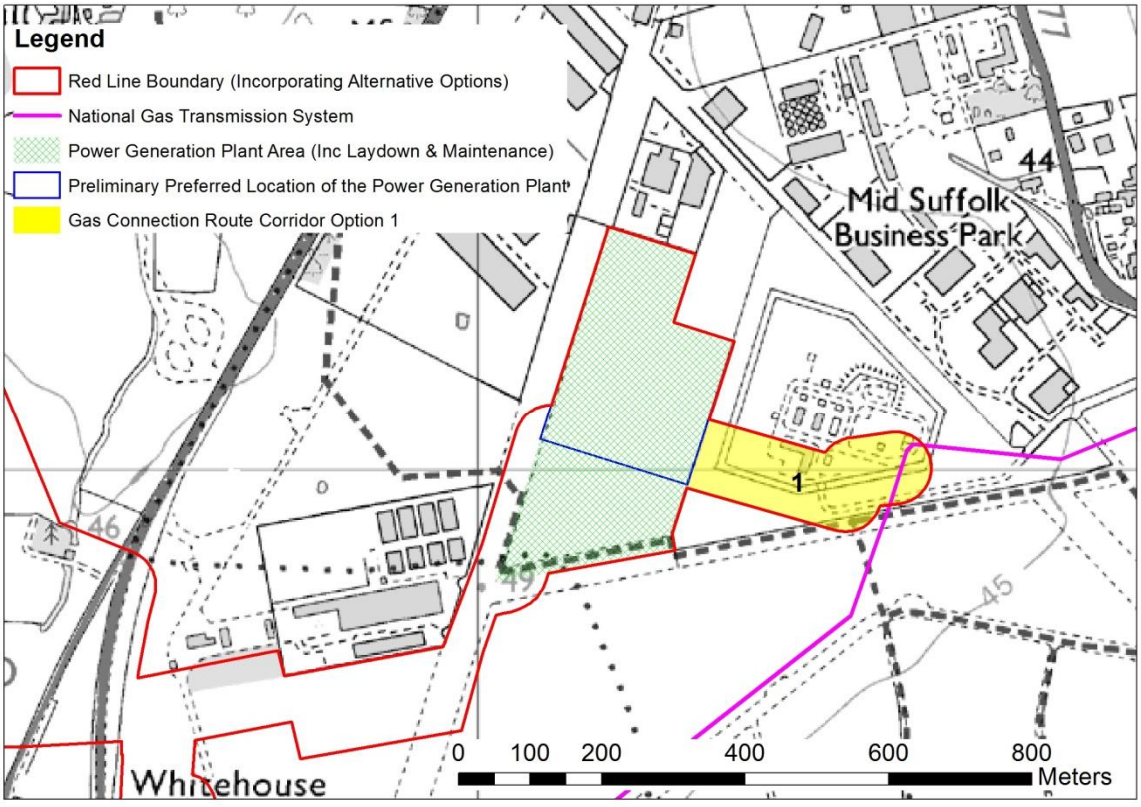
Gas Connection Route Corridor Option 1

4.5.11 The 1st route corridor option (Route 1) shown in Insert 4.2 is approximately 0.1 km in length including no major crossings of any type.

4.5.12 The pipeline begins at the Power Generation Plant site heading east out of the site directly into the National Grid Gas Compressor Station located adjacent to the site.

4.5.13 This option provides the shortest possible route and potentially has the least impact on the area and surrounding environment, but could have further technical complications, due to the potential impact on the operation of the National Grid Gas Compressor Station.

Insert 4.2 - Gas Connection Route Coridor Option 1

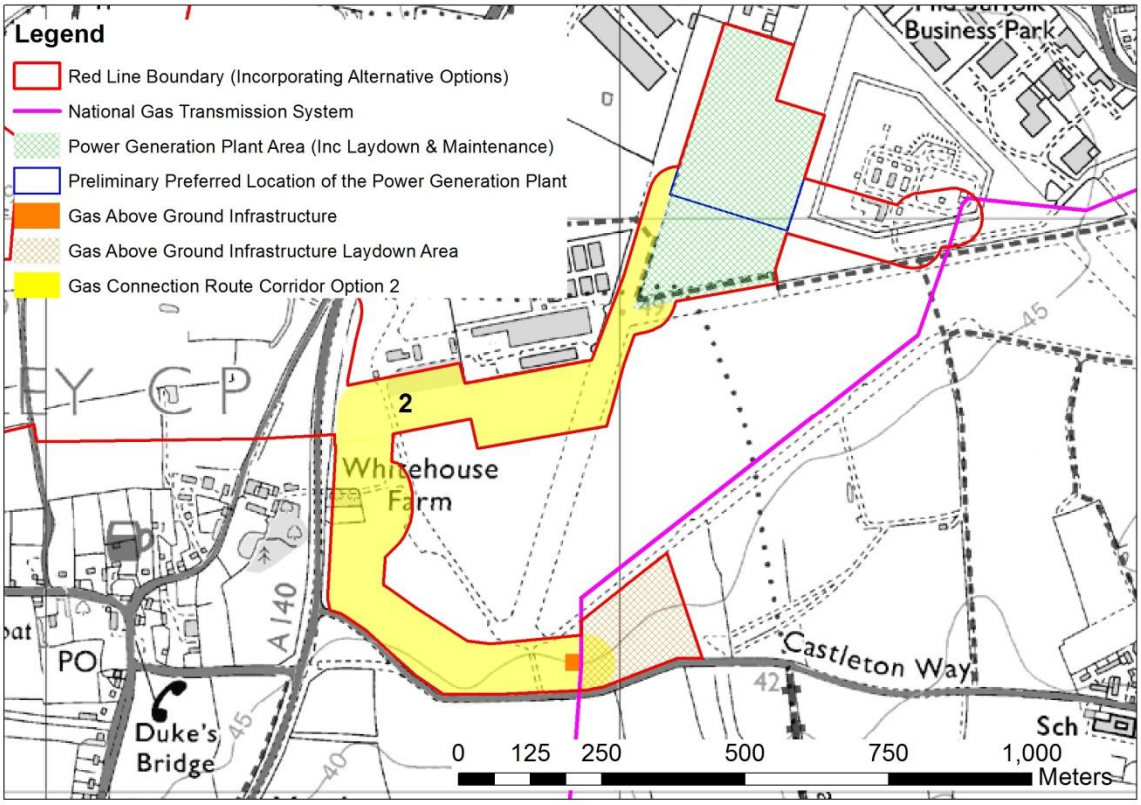


Gas Connection Corridor Option 2

4.5.14 The second route corridor option (Route 2) shown in Insert 4.3 is approximately 1.5 km in length and includes 2 minor road crossings.

4.5.15 The route begins at the south west corner of the Power Generation Plant site, immediately crossing Potash Lane. The route would then traverse west, along the northern edge of the agricultural field located west of Potash Lane, crossing a small track and continuing west until it meets the A140. At this point the route turns south to follow the eastern edge of the A140 until it meets Castleton Way. From here the route heads east, along the southern edge of the agricultural field, crossing Potash Lane again before entering the field to the north of Castleton Way where a new Minimum Offtake Connection (MOC) or Above Ground Installation (AGI) would be situated.

Insert 4.3 - Gas Connection Route Corridor Option 2



4.5.16 It is noted that the above plans show large buffers or potential areas in which each route may be developed. This is due to the fact that detailed studies are still ongoing to assess all potential constraints. However, following the completion of these detailed studies, the route choices will be refined as the Project progresses and the options narrowed to a single route corridor option.

4.5.17 Connection to the NTS at any high pressure pipeline would require two above ground facilities to be installed, an MOC facility, which would be owned by National Grid, and a PIG Trap Facility (PTF) which would be

owned by PPL. The two facilities would contain the following pieces of equipment.

4.5.18 The MOC (approximately 30x30 m) would contain:

- Remotely Operable Valve (ROV)
- Control and Instrumentation Kiosk
- Electrical supply kiosk

4.5.19 PTF (approximately 30x23 m) would contain:

- PIG launching facility;
- Emergency Control Valve;
- Isolation Valve;
- Control and Instrumentation Kiosk
- Electrical Supply Kiosk.

4.5.20 Consultation feedback will be considered in determining which corridor option is the most appropriate.

4.5.21 The gas pipeline would be designed, constructed and tested to comply with the Institute of Gas Engineers' (IGE) Recommendations on Transmission and Distribution Practice – IGE/TD/1: Edition 5, 2009 - Steel Pipelines and Associated Installations for High Pressure Gas Transmission (IGE/TD/1).

4.5.22 The standard gas pipeline wall thickness would comply with the requirements of IGE/TD/1, which defines the minimum safe separation distance between a high pressure gas pipeline and normally inhabited buildings / major roads / major railways. This minimum safe separation distance is known as the Building Proximity Distance (BPD). If normally inhabited buildings / major roads / major railways are closer than 1 BPD (i.e. the gas pipeline is in an area where additional protection is required), thicker wall steel pipe (known as proximity pipe) would be used. The exact locations and lengths of where thicker wall steel pipe will be used will be confirmed throughout the assessment and detailed design stages.

4.5.23 The gas pipeline would be buried to a depth of cover which is in accordance with recognised industry standards. For example, depths of cover would be:

- No less than 1.2 m in agricultural land;
- No less than 2 m under road crossings; and

- No less than 1.7 m under water crossing.

Gas Connection Construction

4.5.24 Construction of the gas pipeline is likely to take place within a temporary fenced strip of land called the 'working width'. The gas pipeline working width is required to facilitate safe construction and the protection of off-site receptors.

4.5.25 It is likely that the working width may be ~ 40 m (where specialist crossings are required) along the length of the gas pipeline route, although it may be necessary to increase / decrease the working width at specific points. For example, adjacent to special crossings it may be necessary to increase the working width to provide additional working areas and storage for materials or special plant. Alternatively, adjacent to areas of conservation or existing services it may be necessary to decrease the working width.

4.5.26 Access to the working width will be at defined points along the gas pipeline route. These points will be carefully controlled and signposted, and gates / stiles will be incorporated into the temporary fences wherever access must be maintained (e.g. for public rights of way).

4.5.27 Where appropriate, access across watercourses will be achieved by the installation of temporary pipes (flumes) within the channel which will then be ramped over to create a continuous running track for construction vehicles, yet still allow a continuous flow of water within the channel of the watercourse. Where flumes are not appropriate, alternative crossing methods will be discussed with the relevant consultees, including the EA and Natural England.

4.5.28 Aside from the special crossings, where trenchless techniques may be used to reduce impact on sensitive areas, it is expected that the pipeline will be constructed using standard open-cut cross-country pipeline construction techniques. The main activities will include: topsoil stripping; pipe stringing (the process of laying the pipe end to end) and welding; trench excavation; pipe laying (positioning of the welded pipe into the trench); back filling; pressure testing, drying and pipeline pigging operations; and re-instatement of the land.

4.5.29 Topsoil will be stripped within the working width along the pipeline route and a running track will be established to allow the movement of machinery. The pipeline will be constructed from lengths of steel pipe of a length of up to approximately 12 m. These are normally off-loaded with cranes at road crossings, transported along the working width and laid out on timbers adjacent to the trench line in preparation for welding and lowering into the trench. The individual lengths of pipe are then

welded together to form the pipeline which is then subjected to inspection. Once the welds are accepted, a standard coating is applied on site. The pipeline coating is the tested electronically along the whole of its length to detect damage or other defects, which if present would be repaired and before re-testing.

4.6 Electrical Connection

4.6.1 A new connection would be required to allow electricity generated by the Power Generation Plant to be exported to the electricity transmission network.

4.6.2 A grid connection assessment was undertaken for the Power Generation Plant site in April 2013. The assessments analysed the transmission and distribution grid connection options and determined the available thermal and fault level capacity on the electrical network. Discussions were also held with the National Grid Company (NGC).

Location of new Electrical Connection Compound (Substation and SEC)

4.6.3 In order to establish the most technically, economically, and environmentally appropriate location for the new Electrical Connection Compound, a Siting Study has been carried out. This study comprised a desk based assessment to consider which areas within the vicinity of the proposed Power Generation Plant could be suitable for the siting of a substation and SEC.

4.6.4 To ensure that the potential substation would not introduce unwanted visual impacts, it was decided that the search area for the study would be limited to an area that could be reached by an underground cable, thus ensuring that additional overhead lines could be ruled out at the offset.

4.6.5 The study considered a number of sites, which were within a radius of 3 km from the proposed Power Generation Plant site (which is the longest economically viable distance for an underground Electrical Connection of this type), and assessed their suitability based on the potential impacts on Noise, Landscape and Visual Impact, Ecology, Water and Flood Risk, Geology and Agriculture, and impacts on Cultural Heritage Assets and Archaeology.

4.6.6 The Substation Siting Study found that, although some mitigation measures would need to be put in place, due to the relatively uniform nature of the local environment, there are no constraints to the development of a substation that favour one site over another along the existing 400 kV power line. As such, it has been decided that the most

suitable location for a new substation would be as close to the Power Generation Plant as possible, as this would shorten the underground Electrical Connection route and thus reduce the impact that construction of the Electrical Connection may have on any potentially environmentally sensitive receptors.

4.6.7 As such, two potentially suitable locations have been considered within this PEIR.

4.6.8 **Electrical Connection Compound Option 1** is located to the south of the Leys, within agricultural land to the north of Mellis Road (see Insert 4.4).

4.6.9 **Electrical Connection Compound Option 2** is located to the north of the Leys, within agricultural land off Leys Lane between The Leys and Goswold Hall (see Insert 4.5).

Revised Electrical Connection Route Corridor Options

4.6.10 The Electrical Connection route corridor for the Project will be dependent upon which of the two Electrical Connection Compound options is preferred following the consultation and the final position of the compound within that option. At this stage, two potential route corridor options have been identified, each identifying a potential underground Electrical Connection route for each of the Electrical Connection Compound options. Each of these routes is described below and presented is Insert 4.3 and 4.4.

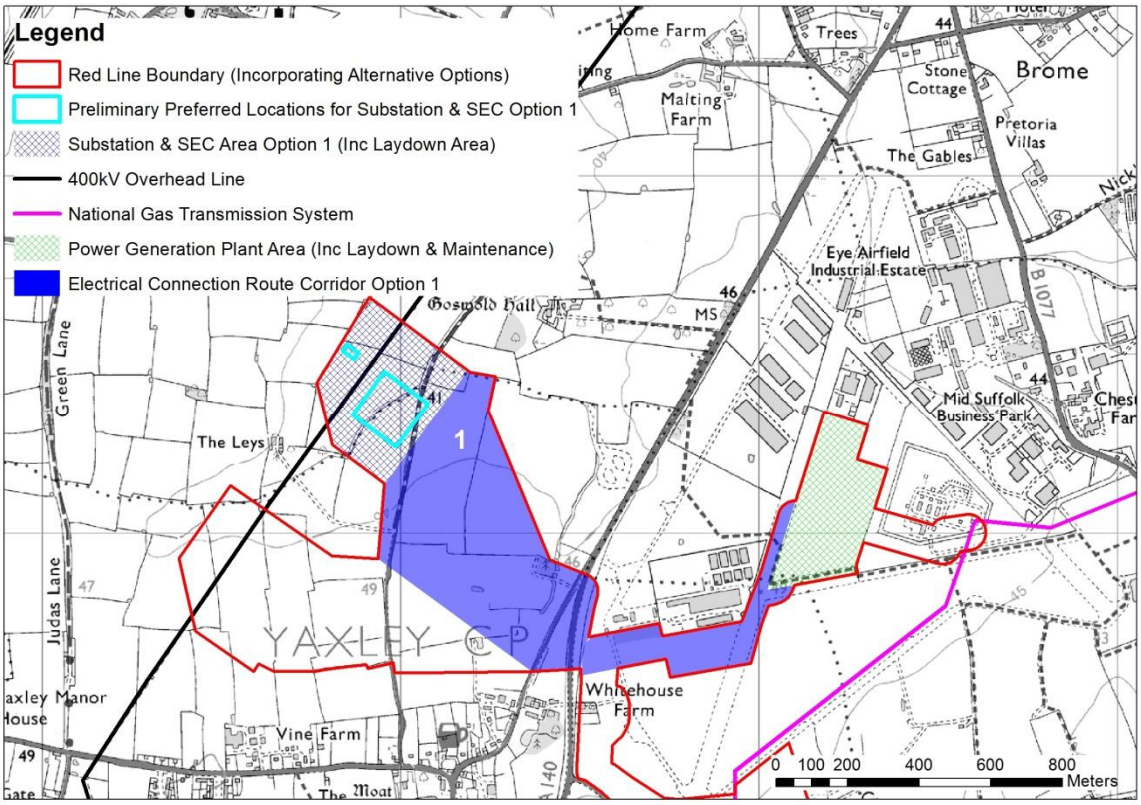
Electrical Connection Route Corridor Option 1 (serving Electrical Connection Compound Option 1)

4.6.11 As shown on Insert 4.4, the underground Electrical Connection would exit the western edge of the Power Generation Plant site and head south down Potash Lane (the former Eye Airfield Runway) before turning west, to the south of the Speed Deck factory and crossing the northern edge of the agricultural field towards the A140. At the A140, the Electrical Connection would pass under the road before heading in a north westerly direction across the agricultural land towards the 400 kV line.

4.6.12 As the location of the new Electrical Connection Compound is still to be finalised, the exact route cannot be described in detail, however, it is possible to state that the route would be designed in a way that provides the shortest possible distance (therefore reducing environmental impact), whilst ensuring habitats are protected and agricultural disruption is minimised (by following field boundaries and

avoiding routes that would require the removal of sensitive habitats (e.g. mature trees and hedge rows)).

Insert 4.4 - Electrical Connection Compound Option 1 and Electrical Connection Route Option 1



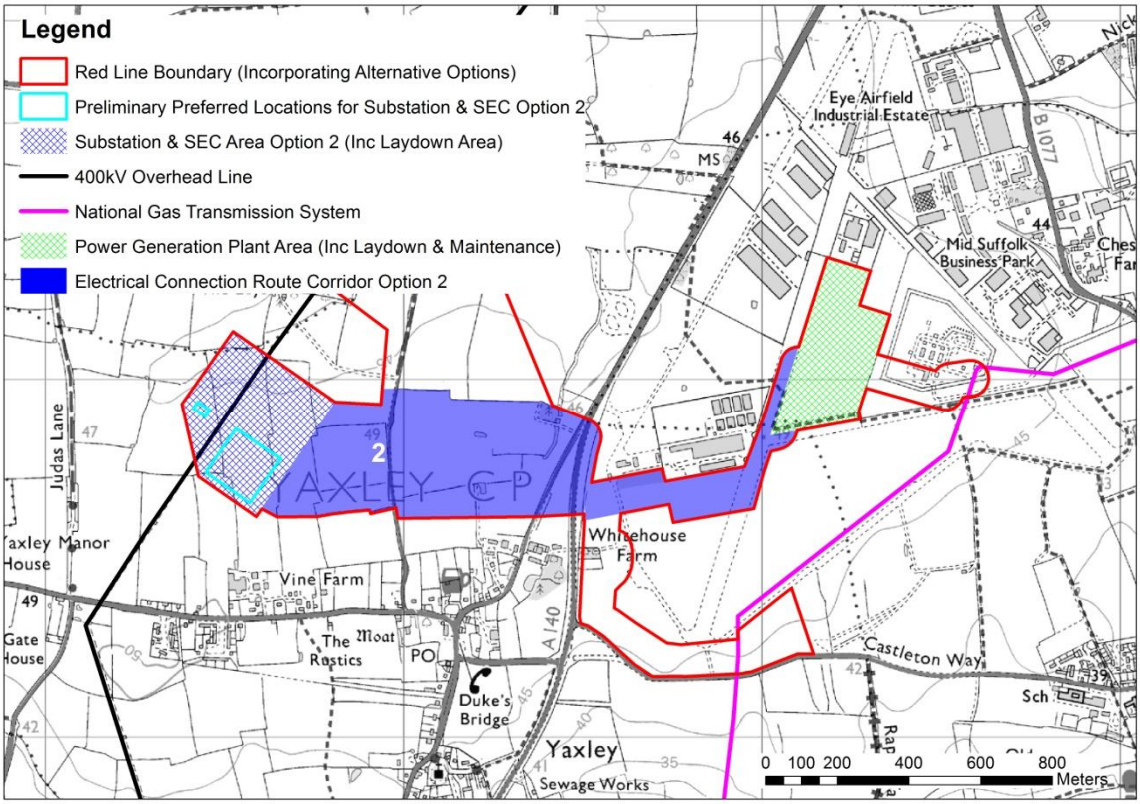
Electrical Connection Route Corridor Option 2 (serving Electrical Connection Compound Option 2)

4.6.13 As shown on Insert 4.5, the underground Electrical Connection would exit the western edge of the Power Generation Plant site and head south down Potash Lane (the former Eye Airfield Runway) before turning west, to the south of the Speed Deck factory and crossing the northern edge of the agricultural field towards the A140. At the A140, the Electrical Connection would pass under the road before heading in a westerly direction across the agricultural land towards the 400 kV line.

4.6.14 As the location of the new Electrical Connection Compound is still to be finalised, the exact route cannot be described in detail, however, it is possible to state that the route would be designed in a way that provides the shortest possible distance (therefore reducing environmental impact), whilst ensuring habitats are protected and

agricultural disruption is minimised (by following field boundaries and avoiding routes that would require the removal of sensitive habitats (e.g. mature trees and hedge rows)).

Insert 4.5 - Electrical Connection Compound Option 2 and Electrical Connection Route Option 2



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4.6.15 Construction and maintenance access for both of the above options is likely to follow the final Electrical Connection route corridor once agreed. It is likely, however, that access improvement works will be required at the northern end of the preferred access route, Old Norwich Road, between White House Farm and the fishing pond. A portion of Leys Lane will also likely require improvement works.

4.6.16 Further details of alternative options and these access requirements, and potential improvement works will be provided and assessed in the ES.

Electrical Connection Construction

4.6.17 Cable installation will follow a similar method to hat for the gas connection. It would predominantly be carried out in an excavated

trench with cable directly buried in the trench (open-cut method). The cable bedding will be laid (at a typical 1 m below ground level, subject to existing conditions and the location of existing buried services) and the cable pull set up. Once the cables are pulled in and the rollers removed, the cable surround can be installed with cable protection cover slabs placed over the cable. Finally, the backfilling and final reinstatement will be undertaken.

4.6.18 For cable installation on / across narrow roads with small verges, installation in pre-installed ducts constructed under the road is preferred due to potential impacts to road traffic of the open-cut installation method. The installation of ducts and trench re-instatement would be completed in stages, given the need for excavations and a working area, and progress on a daily basis. Once all ducts were installed, cable joint bays would be excavated, ideally in the verges, and the cables pulled in.

4.6.19 As for the gas connection, trenchless techniques may be used to reduce impact on sensitive areas.

SECTION 5

SITE SELECTION, ALTERNATIVES AND DESIGN EVOLUTION

5 SITE SELECTION, ALTERNATIVES AND DESIGN EVOLUTION

5.1 Introduction

5.1.1 The EIA Regulations[6] require that an ES should include an outline of the main alternatives that have been studied by the applicant and an indication of the main reasons for the ultimate choice of option, taking into account likely significant environmental impacts. Under the EIA Regulations there is no requirement to assess alternatives, only a requirement to provide information about those alternatives that have been considered.

5.1.2 The proposed Project has gone through several iterations and evolutions in design, and the site selection itself has been an iterative process. The following alternatives have been considered for The proposed Project as part of the design evolution process:

- Alternative development sites;
- Alternative layouts;
- Alternative technologies for electricity generation;
- Alternative options for the Electrical Connection; and
- Alternative options for the Gas Connection.

5.1.3 An account of these alternatives is provided below.

5.2 Alternative Development Sites

5.2.1 In deciding upon the Power Generation Plant site, WPL has had regard to a number of factors, such as those described in NPS EN-2. However, in line with paragraph 2.2.1 of NPS EN-2, "it is for energy companies to decide which applications to bring forward and the government does not seek to direct applicants to particular sites for fossil fuel generating stations" unlike, for example, nuclear generating stations.

5.2.2 As part of a detailed feasibility assessment, WPL looked at a range of sites around the UK to support power generation plants of this nature. The key factors which WPL considered necessary in a site were broadly fourfold; technical, environmental, economic, and in line with local planning policy.

[6] See Paragraph 18 of Part 1 to Schedule 4 of the EIA Regulations.

5.2.3 In terms of technical constraints, the size of the site (i.e. large enough to support a power generation plant of up to 299 MW and integral infrastructure) and the proximity of a site to appropriate gas and electrical connection points were both key considerations.

5.2.4 From an environmental perspective, the site must have due regard to close sensitive receptors (to avoid unnecessary impacts from noise and visual disturbance), the current make up of the surrounding area (to limit impacts on the landscape character of the area), previous site uses and land quality (to avoid sterilisation of the best and most versatile agricultural land or mineral assets) and proximity to sensitive ecological habitats.

5.2.5 Based on these factors, the site at Eye was considered suitable for the siting of a 299 MW Power Generation Plant for the following reasons:

- Close proximity (<1 km) to the gas NTS;
- Close proximity (<1.5 km) to a high voltage electrical transmission infrastructure;
- The site is within an existing industrial estate;
- The site is surrounded by similar industrial developments including the Eye Chicken Litter Power Station ;
- The area is identified in the emerging EADF as an area that MSDC has aspirations to develop as an energy park; and
- There is more than adequate space on site to develop the Power Generation Plant and integral infrastructure.

5.3 Power Generation Plant

5.3.1 Previous consultation documents (e.g. the Scoping Report (PRO-4100-PB-ENV-RPT-R40) submitted to SoS in May 2013) identified four potential technology options which could be developed to generate 299 MW.

5.3.2 The four options under consideration were: CCGT plant, SCGT plant and RGE plant. Consideration was also given to the potential utilisation of CHP at the site.

5.3.3 Since the submission of the Scoping Report, further conceptual design studies and financial modelling of the four options above have determined that an SCGT plant would be a suitable option for a 299 MW peaking plant at the Power Generation Plant site. Such plants are designed to only operate during periods of peak demand, where they can be called upon at short notice to provide additional electricity to the grid or when there is a shortfall from other sources of electricity

generation (such as from Wind Farms on calm days when there is no wind). This has been determined based on the following environmental, business drivers, and technical considerations:

Environmental

5.3.4 In a CCGT plant, the hot exhaust gases are routed through a heat recovery steam generator (HRSG), where they are condensed to form steam, which then drives a steam turbine. In comparison, the hot exhaust gases in a SCGT plant are discharged to the atmosphere via the stack, with the flue gases. This means that the flue gases discharged from a SCGT plant are significantly hotter than those discharged from a CCGT plant, and therefore the gases are much more buoyant.

5.3.5 This means that a much lower stack is required for a SCGT plant to achieve the same “effective stack height” and required dispersion as a CCGT plant. The Scoping Report suggested that the stack of a single unit CCGT plant could be up to 90 m to achieve adequate dispersion in order to meet air quality standards. Subsequent air quality modelling screening runs (described in detail in Section 6 of this PEIR) have determined that a suitable stack height to achieve adequate dispersion of pollutants from a SCGT plant at the Power Generation Plant site is a maximum of 30 m.

5.3.6 This represents a significant overall reduction in stack height, and the associated landscape and visual impacts arising from the tallest structures on site in comparison to a CCGT plant. Further description of the Landscape and Visual assessment of the proposed Project is outlined in Section 11 of this PEIR.

5.3.7 When a SCGT plant is compared to a RGE plant, although there is no benefit in terms of reduction of stack height (stack height for RGE units and SCGT units would be similar) the noise emissions from RGE plant are typically louder than for a SCGT plant. This is because RGEs operate using ignition of gaseous fuels and air in a specific mix which causes motion of a piston to generate electricity.

5.3.8 Furthermore, in order to generate steam for the steam cycle of a CCGT plant, a sizeable quantity of water would be required. Through discussion with the EA and MSDC it is clear that the availability of water in the local area is extremely limited. There are no surface watercourses that would be suitable for abstractions, and although the site is underlain by a principle aquifer, through discussions with the EA PPL is aware that this aquifer is already heavily abstracted, putting significant pressure on the local water supply, and as such it is unlikely that an abstraction licence for the proposed Project would be granted.

As such, SCGT technology is preferable in this area as the water requirement is significantly less, and could be met with the occasional delivery of water by tanker.

Economic Drivers

5.3.9 Compared to both RGE and CCGT plant, SCGT units typically have a much smaller capital cost per MW. This is largely because CCGT plant is more complex in their operation (see below for technical considerations) and are more efficient. RGE plants are also more flexible and allow operation on different fuels. However, as explained in Section 4, the nature of the Power Generation Plant at Eye is that of a peaking plant which will operate for less than 1500 hours per year. Over this timescale, the benefits in efficiencies or flexibility which can be achieved by using a CCGT or RGE plant are very minimal and do not warrant the additional capital costs of these plant. As SCGT plants are less complex in operation than CCGT or RGE plant, they are also cheaper to construct and maintain.

Technical

5.3.10 As previously mentioned, technically, CCGT plant is more complex than a SCGT plant, primarily because of the presence of an HRSG and steam cycle. In turn, this leads to more difficult maintenance requirements and a much longer construction timescale because of the large number of interconnections.

5.3.11 Although CCGT plant are more efficient, due to their use of waste heat (around 60% compared to 40% for SCGT) this gain in efficiency is unlikely to be warranted given the limited number of operational hours which the Power Generation Plant will run (less than 1500 hours per annum).

5.3.12 Due to the method in which fuel is combusted in RGEs, there is also usually a requirement for additional control of NOx emissions in order to meet IED guidelines. This additional NOx control would usually be in the form of Selective Catalytic Reduction (SCR) which would not only require further land take and more maintenance, but may also require ammonia or urea injection to operate. This then has impacts in terms of environmental disposal of catalysts, as well as ammonia slip which is released from the stack.

CHP

5.3.13 Efficient CHP plants are usually designed to meet the demands of an identified heat load. Electrical power generation is utilised, where applicable for local process plant, and the balance exported to the grid.

The heat demands of industrial processes are usually continuous, and district heating demands are also usually continuous (albeit on a seasonal basis).

5.3.14 Therefore, this is in direct contrast to the operation of an SCGT peaking plant, which is designed to operate intermittently and unpredictably. Accordingly, any heat loads would be better served, and met more appropriately and efficiently, by dedicated CHP plants, allowing the SCGT plant to provide the necessary support to the National Grid Electricity Transmission System.

5.3.15 In addition, as SCGT plant do not have any associated HRSG / steam turbine plant, the provision of steam from an SCGT plant would not be possible without the provision of additional steam raising plant / equipment, which would require more equipment to be constructed and a larger overall land take.

5.3.16 Following consideration of environmental, economic and technical drivers, PPL considers that the balance of these considerations clearly favours SCGT technology (without CHP) for delivery of a 299 MW peaking plant.

5.4 Gas Connection

5.4.1 The Scoping Report identified seven potential Gas Connection options to connect the Power Generation Plant to Feeder 5 on the NTS.

5.4.2 Further analysis from additional studies has determined that five of these route corridor options are no longer feasible ((options 2, 2a, 2b, 3 & 5) See Section 3.4 of the Progress Power EIA Scoping Report)).

5.4.3 **Options 2, 2a** and **2b** have all been discounted as they would pass within close proximity to the recently consented wind turbines located to the south of proposed Power Generation Plant site . This would breach National Grid safety guidelines for the positioning of gas pipes and wind turbines. Options 2 and 2b also cross the centre of the field meaning that a large area of the field would be rendered unusable.

5.4.4 **Option 3** has been discounted as this could produce a barrier between the agricultural field to the west and the rest of the Airfield Industrial Estate, thus potentially reducing its development value in the future. (See Section 3.4 of the Progress Power EIA Scoping Report).

5.4.5 **Option 5** has been discounted as this would require passing through a currently busy and operational part of the business park (See Section 3.4 of the Progress Power EIA Scoping Report). The construction of

this option could cause significant disruption to these businesses which would not be acceptable.

5.4.6 Therefore, route corridor options 1 and 4 (as identified in Section 3.5 of this PEIR) are still under consideration for the proposed Project and are subject to preliminary assessment in this PEIR.

5.5 Electrical Connection Compound (Substation and SEC)

5.5.1 Preliminary outline designs for the Electrical Connection Compound suggest that it would be composed of a new SEC and a new air insulated switch yard (i.e. substation). The SEC would be approximately 45 m X 22 m located on the west side of the existing overhead line and the new air insulated switch yard including an array of electrical switching gear and other works areas would be 150 m X 150 m, located on the east side of the overhead line.

5.5.2 The exact location for the proposed new Electrical Connection Compound is still under review. A recent Substation Siting Study identified two potentially suitable areas, both of which have up to 12 ha in area. However, the electrical connection compound would only be approximately 3 ha in size

5.5.3 The first of the two areas is located on open agricultural land south of The Leys, and north of Vine Farm, while the second location is located further north between The Leys and Goswold Hall (see inserts 4.4 and 4.5) .

5.5.4 These areas have both been subject to environmental studies, some of which are ongoing, and the preliminary environmental effects of developing an Electrical Connection Compound at either one of the sites is presented within the following sections.

5.6 Electrical Connection Route Corridor

5.6.1 The proposed Project Scoping Report identified a large ‘opportunity area’ to the west of the A140. Based on the findings of the Scoping Report, it was proposed that this large opportunity area would be the focus of any studies related to the development of the Electrical Connection corridors.

5.6.2 Since the publication of the Scoping Report, numerous ecological surveys were undertaken which identified a number of ecological constraints in the opportunity area.

5.6.3 The ecological constraints were considered by the Project team and it was decided that the majority (northern area) of the opportunity area

would not be suitable for the development of Electrical Connection corridors. As such it is likely that the Electrical Connection point will be located in the south of the opportunity area, between Vine Farm and Goswold Hall.

5.6.4 The exact configuration and route of the Electrical Connection will be dependent upon the outcome of the preferred Electrical Connection Compound location.

5.6.5 At present, two Electrical Connection route corridor options (one for each Electrical Connection Compound area) have been identified within this PEIR and the preliminary assessment findings of developing an underground Electrical Connection along those corridors is presented in the following sections.

SECTION 6

AIR QUALITY

6 AIR QUALITY

6.1 Introduction

6.1.1 The construction, operation and de-commissioning of the proposed Project all have the potential to impact on local air quality. During construction and decommissioning, all elements of the proposed Project have the potential to generate emissions, such as from construction vehicle exhausts and dust, and thus impact on local air quality. This Section provides a preliminary assessment of the Air Quality impacts of the proposed Project, incorporating the Power Generation Plant, the two Gas Connection options and the two Electrical Connection Compound and Electrical Connection options.

6.2 Legislative and Policy Context

Ambient Air Quality Directive

6.2.2 Council Directive 96/62/EC on ambient air quality assessment and management (the Air Quality Framework Directive) described the basic principles as to how air quality should be assessed and managed in the Member States. Subsequent Daughter Directives introduced numerical limits, thresholds and monitoring requirements for a variety of pollutants including NOx and SO_2 to guarantee that there are no adverse effects with regard to human health.

6.2.3 Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe (the Ambient Air Quality Directive) merges the Air Quality Framework Directive with the First, Second and Third Daughter Directives. The Ambient Air Quality Directive identifies desired maximum ground level concentrations and the date by which the objectives should be met and introduces new objectives for fine particles.

6.2.4 The Air Quality Standards Regulations 2010 (the AQS Regulations) give effect, in England, to the Ambient Air Quality Directive.

Air Quality Standards Regulations 2010

6.2.5 The AQS Regulations specify a series of standards and objectives for air quality in the UK. The objectives are summarised, as appropriate to the proposed Project, in Table 6.1

Table 6.1 - UK AQS Objectives for Ambient Air Quality

Pollutant	Averaging Period	Objective (Ground Level Concentration) ($\mu g/m^3$)	Number of permitted Exceedences
Nitrogen Dioxide (NO_2)	1 Hour Annual	200 40	18 -
Carbon Monoxide	8-hour rolling	10 000	-

6.2.6 The AQS Regulations have also been implemented through the Air Quality Strategy for England, Wales, Scotland and Northern Ireland (2007).

Local Air Quality Management

6.2.7 The Environment Act 1995 requires local authorities to review air quality within their district or borough in order to determine where pollutant levels identified in the Air Quality Framework Directive may be in excess of the standards.

6.2.8 If pollutant levels in an area are likely to exceed statutory objectives, then local authorities must declare an Air Quality Management Area (AQMA) and draft an Action Plan to achieve the statutory objectives. The Department of Environment, Food and Rural Affairs (DEFRA) has issued technical guidance to local authorities to assist in undertaking this task.

6.2.9 This gives the local authority a clear picture of the sources which can be controlled or influenced, and aid the local authority to target more effectively the relative contributions of industry, transport and other sectors and ensure that the solutions are cost effective and proportionate when producing their Action Plan.

6.2.10 As part of the on-going review and assessment process of AQMAs, a phased approach has been adopted to ensure that the level of local authority assessment is commensurate with the risk of an air quality objective being exceeded. Therefore, each local authority is required to undertake an Updating and Screening Assessment (USA) of the AQMAs within their administrative area in order to identify changes which have occurred since the previous review and assessment that could potentially lead to a risk of an air quality objective being exceeded. Where a risk has been identified the local authority is

required to undertake a more detailed assessment to determine the likelihood of an exceedence and revise the AQMA as appropriate.

Industrial Emissions Directive (IED)

6.2.11 Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (IED) recast seven directives related to industrial emissions, in particular Directive 2008/1/EC of 15 January 2008 concerning integrated pollution prevention and control (the Integrated Pollution Prevention and Control (IPPC) Directive) and Directive 2001/80/EC of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants (the Large Combustion Plant Directive (LCPD)), into a single legislative instrument to improve the permitting, compliance and enforcement regimes adopted by Member States.

6.2.12 The IPPC Directive laid down measures to prevent or, where that is not practicable, to reduce emissions in the air, water and land introducing ELVs and BAT. The LCPD prescribed ELVs for nitrogen oxides, sulphur dioxide and particulates. These are the pollutants relevant to the EIA of the proposed Project.

6.2.13 The IED makes provisions for the continuation of the requirements and principles of the IPPC Directive and the LCPD and introduces new, more stringent, ELVs with full compliance required by 1st January 2016.

6.2.14 The LCPD and IPPC Directive are implemented in England and Wales by the Environmental Permitting (England and Wales) Regulations 2010 (the EP Regulations).

Environmental Permitting (England and Wales) Regulations 2010

6.2.15 The Environmental Permitting (England and Wales) (EP) Regulations 2007 sought to introduce a single streamlined environmental permitting and compliance regime to apply in England and Wales. They do this by integrating the previous regimes covering waste management licensing and Pollution Prevention and Control. The EP Regulations increase the scope of the 2007 Regulations.

6.2.16 The EA will control and regulate the Power Generation Plant with respect to the emissions to air from the stack(s) via an Environmental Permit that will be required for the proposed Project, under the EP Regulations. The Environmental Permit will include specific ELVs to apply to the Power Generation Plant for the relevant pollutants considered within the IED. Such limits will be based on the associated emissions levels (AEL) of recognised BAT as per current EA guidance

notes and the existing EU IPPC 'Reference Document on Best Available Techniques for Large Combustion Plant' (2006) and the draft update of this document, 'Best Available Techniques Reference Documents for the Large Combustion Plants' (2013) (together, "BREF Notes").

The Habitats Directive

6.2.17 The European Habitats Directive (92/43/EEC) sets out the legal framework requiring EU member states to protect habitat sites supporting vulnerable and protected species, as listed within the Directive. This Directive is transposed into UK law by the Conservation of Habitats and Species Regulations 2010 and requires protection of ecological sites including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

6.2.18 The Habitats Directive is implemented in England and Wales by the Habitats and Species Regulations 2010.

6.2.19 Across the UK, site-specific critical levels (which relate to airborne pollutant concentrations at ground level) and critical loads (which relate to deposition of materials to soils) have been set for a variety of protected habitats and species in order to allow the quantitative assessment of the condition of ecologically sensitive sites and thus the protection of such sites by the relevant competent authorities.

The Ambient Air Quality Directive

6.2.20 The Ambient Air Quality Directive sets ambient air quality guidelines for NOx for the protection of ecosystems. This imposes a long-term (annual average) limit for NOx of 30 µg/m3 (critical level). In terms of the limit for the protection of ecosystems, it is important to define the areas in which the limit is to be achieved. Directive 2008/50/EC states that sampling points to determine concentrations should be:

- 20 km from an agglomeration (which is defined as an area with a population of more than 250 000); or
- At least 5 km from other built-up areas, industrial installations or motorways or major roads with traffic counts of more than 50 000 vehicles per day;
- Representative of air quality in a surrounding area of at least 1000 km^2.

6.2.21 This is mirrored in the Air Quality Standards Regulations 2010.

National Policy Statements

6.2.22 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic air emissions impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

6.2.23 Paragraph 5.2.4 of EN-1 states that: "Emissions from combustion plants are generally released through exhaust stacks. Design of exhaust stacks, particularly height, is the primary driver for the delivery of optimal dispersion of emissions and is often determined by statutory requirements."

6.2.24 EN-2 highlights, in paragraph 2.5.3, that the significant emissions to air from fossil fuel generating stations will be oxides of nitrogen and sulphur dioxide, whilst noting that the emissions of sulphur dioxide from gas-fired generating stations may be negligible.

6.2.25 In relation to the assessment of air quality impacts by a developer, paragraph 5.2.10 of EN-1 requires that the SoS takes into account any relevant statutory air quality limits and that developers should work with the relevant authorities to secure appropriate mitigation measures to allow the proposal to succeed.

6.2.26 Paragraph 5.2.11 states that: "The [Secretary of State] should consider whether mitigation measures are needed both for operational and construction emissions over and above any which may form part of the project application. A construction management plan may help codify mitigation at this stage."

Other National and Local Policy

6.2.27 Whilst the PA 2008 is clear as to the primacy of the relevant NPS, other national and local planning policy may be considered important and relevant by the SoS in the determination of an energy NSIP.

6.2.28 The NPPF states (paragraph 7) that the planning system should perform a number of roles in delivering sustainable development including an environmental role "contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently,

minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy."

6.2.29 Saved Policy E12 of the Mid Suffolk Local Plan (1998) seeks that industrial development should not adversely affect neighbouring properties in respect of smell, noxious emissions or dust.

6.2.30 Policy CS4 of the Core Strategy DPD of the Mid Suffolk Local Development Framework (2008, and as updated in the Focused Review of 2012) seeks that development that harms the quality of air and/or causes dust or odour will be avoided where possible, to protect people and the environment. Policy CS5 seeks that development proposals maintain and enhance the environment.

6.3 Project Scenario for Assessment

6.3.1 In respect of Air Quality, the realistic worst case scenario from within the proposed Project parameters (which are described in Section 4 of this PEIR) are set out in Table 6.2.

6.3.2 The reason that this represents the realistic worst case in relation to air quality impacts is that the buoyancy of a plume is, principally, a function of its temperature and volume. Assuming the thermal efficiency of the units for all options of between one and five units is the same, a specific plant electrical output will require a specific amount of natural gas. The combustion of this gas would thus result in a specific volume of flue gas.

6.3.3 The temperature of the flue gases will be similar irrespective of the number of installed units. However, if the flue gases are split between multiple stacks, the volumetric flow rate of each plume will be reduced (e.g. the use of five stacks will emit 20 per cent of the total flue gas volume) thus reducing the buoyancy of the flue gases proportionately.

6.3.4 The reduction in buoyancy will limit the potential for atmospheric dispersion of the flue gases. For instance, simple plume rise calculations indicate that the potential plume rise for emissions from five individual stacks would be around half that which could be achieved for emissions for the same total volume of flue gas but from two individual stacks.

6.3.5 Additional evidence of this is provided in this Section as the assessment to date has considered two of the potential options for the number of units to be utilised for the proposed Project. Therefore, the assumed realistic worst case scenario is considered robust.

6.3.6 A preliminary assessment of both options for the Gas Connection and the Electrical Connections is presented in this section. A decision on the preferred option for each will be taken following consultation.

Table 6.2 - Realistic Worst Case Scenario for Air Quality Impacts

Parameters	Details
Power Generation Plant	
Number of gas turbine units	5 (~ 59 MWe)
Number of stacks	5
Height of Stacks	20 m
Unit type	Aero derivative

6.3.7 Both Gas Connection route corridor options and both Electrical Connection Compound options and Electrical Connection route corridor options are considered in this air quality preliminary assessment.

6.4 Assessment Methodology and Significance Criteria

6.4.1 The assessment methodology set out below is applicable to each of the construction, operation and decommissioning phases. It addresses the way in which the preliminary assessment has been carried out, how the different assessment scenarios described in Section 3 are considered and the technical approach to assessments.

Construction

6.4.2 Construction impacts will be assessed within the EIA and the results and discussions will be presented in the final ES. Preliminary assessment work has been carried out to establish the preliminary likely significant environmental effects so as to inform this PEIR. The methodology for this assessment, which will be carried through into the final ES, is discussed below.

Airborne Particulate Matter

6.4.3 The potential impact of construction site dust is being assessed in accordance with the Institute of Air Quality Management (IAQM) 'Guidance on the Assessment of Construction on Air Quality and the Determination of their Significance' (October 2011). This guidance states:

6.4.4 "The risk of emissions of dust (all types) from a demolition/construction site causing a statutory nuisance, loss of amenity and/or health or ecological effects will be related to:

- the activities being undertaken (demolition, number of vehicles and plant etc.);
- the meteorological conditions (wind speed, direction and rainfall);
- the proximity of receptors to the activity;
- the duration of the activity;
- the adequacy of the mitigation measures applied to reduce or eliminate dust; and
- the sensitivity of the receptors to dust.

6.4.5 Emissions of dust will vary depending on the activities being undertaken throughout the day; and mitigation must be designed to respond to this."

6.4.6 The assessment incorporates a number of stages in order to:

- screen the requirement for a more detailed assessment so that activities unlikely to cause significant effects are not considered further;
- determine the risk of dust effects and hence the need for additional mitigation (i.e. above the standard mitigation that may be expected to be applied to any construction sites); and
- following the definition of the mitigation, the description of the residual effects and their significance.

6.4.7 Under the above Guidance, activities on-site will be divided into four types to reflect their different potential impacts:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (of dust from site/vehicles along access/haulage routes).

6.4.8 The assessment methodology examines the potential dust effects with regards to:

- Annoyance / disturbance due to dust deposition / soiling;
- Harm to ecological receptors; and
- Human health impact due to increase in exposure to fine particulate matter (PM_{10}).

6.4.9 The IAQM Guidance adopts a risk-based approach to air quality associated with construction / demolition and, for each of these aspects, the magnitude of any potential impact is assessed as being

within a dust emissions class that is Large, Medium or Small. These are defined based on the type of activity as follows:

- Demolition:
  - i **Large**: Total building volume >50 000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level;
  - ii **Medium**: Total building volume 20,000 m^3 – 50,000m^3, potentially dusty construction material, demolition activities 10-20 m above ground level; and
  - iii **Small**: Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.
- Earthworks:
  - i **Large**: Total site area >10 000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100 000 tonnes;
  - ii **Medium**: Total site area 2 500 m2 – 10 000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20 000 tonnes – 100 000 tonnes; and
  - iii **Small**: Total site area <2 500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10 000 tonnes, earthworks during wetter months.
- Construction:
  - iv **Large**: Total building volume >100 000 m^3, piling, on site concrete batching; sandblasting;
  - v **Medium**: Total building volume 25 000 m^3 – 100 000 m^3, potentially dusty construction material (e.g. concrete), piling, on site concrete batching; and
  - vi **Small**: Total building volume <25 000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
- Trackout:

vii **Large**: >100 Heavy goods vehicles (HGV) (>3.5 t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;

viii **Medium**: 25-100 HGV (>3.5 t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100 m; and

ix **Small** / **Medium**: <25 HGV (>3.5 t) trips in any one day, surface material with low potential for dust release, unpaved road length <50 m.

6.4.10 The risk-based approach considers the significance of any potential impact with regards to the number / sensitivity of receptors and the distances to the receptors.

6.4.11 The results of the assessments produce a risk level for the site / area of assessment which inform the mitigation and management techniques that should be implemented based on the recommendations of "The control of dust and emissions from construction and demolition – Best Practice Guidance" (Greater London Authority, 2006).

Construction Vehicles and Traffic

6.4.12 The impact of the emissions from construction vehicles (both on- and off-site) is being assessed using the methodology prescribed in the Department for Transport 'Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3, Part 1: Air Quality' for the estimation of emissions from vehicles.

Operation

6.4.13 For the purposes of assessing operational impacts the air quality impact assessment has examined each of:

- Operation of five aero-derivative units (each of c.60 MW)
- Operation of two industrial units (each of c.150 MW)

6.4.14 To assess the air quality impacts that will arise during operation, the assessment has focussed on the dispersion of the flue gases from the stack(s), being the potentially significant sources of emissions to air.

6.4.15 The impacts of the emissions from the stacks has been quantitatively assessed using industry standard air dispersion modelling techniques in accordance with the latest EA guidance, particularly such guidance provided by their Air Quality Modelling and Assessment Unit (AQMAU).

Decommissioning

6.4.16 The air quality impacts of decommissioning will be similar to those that will be assessed for construction. The assessment of demolition air quality impacts is therefore be carried out on the same basis as that for those arising from construction activities with the addition of 'demolition', as per the IAQM Guidance.

Ambient Air Quality and the Protection of Human Health

6.4.17 The AQS Regulations specify a series of standards and objectives for air quality in the UK. The objectives are summarised in Table 6.1 and consider pollutants that are the principal products of industrial combustion processes. These are the basis for the assessment of emissions for the operation phase.

6.4.18 NOx are primarily formed by two reaction routes. 'Thermal' NOx is formed by the reaction of atmospheric oxygen and nitrogen at the high combustion temperatures within the GT whilst 'prompt' NOx is formed by the reaction of atmospheric nitrogen with free radicals from the fuel via a complex series or reactions. Assessment of NOx is important because oxides of nitrogen subsequently convert to NO_2, in the presence of ozone in the atmosphere.

6.4.19 CO is formed by the incomplete combustion of carbon in a fuel. Combustion in GTs is conducted at high excess air rates, typically 200-300 per cent excess air. Therefore there will be only very low levels of carbon monoxide or unburned hydrocarbons present in the flue gases from the Power Generation Plant (as detailed in Table 6.5 and Table 6.6).

Protection of Vegetation and Ecosystems

6.4.20 As set out at Paragraph 6.2.20 above, the long-term (annual average) limit for NOx of 30 µg/m3 is the critical level for the protection of vegetation and ecosystems. The location of sampling points in order to demonstrate compliance with this standard (and therefore areas of where this standard should apply) is influenced by the presence of other industrial installations nearby.

6.4.21 The limitations to the applicability of this standard are noted (as per Paragraph 6.2.19). Nevertheless, the impact of the Power Generation Plant will be assessed against the above standard in order to demonstrate the potential impact. This is considered particularly important given the location with respect to the neighbouring areas afforded EU protection for their ecological status.

6.4.22 Ecological receptors such as the Waveney & Little Ouse Valley Fens SAC and the Major Farm, Gypsy Camp Meadows and Hoxne Brick Pit SSSIs may also be sensitive to the deposition of nutrient nitrogen and the deposition of acidity due to nitrogen as a result of the process contribution to ground level concentrations of NOx.

6.4.23 Atmospheric nitrogen is a source of essential nutrients for vegetation and the ambient concentration commonly limit growth in temperate ecosystems. Increased availability of nitrogen in the air (such as through increases in the ambient concentrations of NOx) can have an effect on species composition of an area, that would favour plants / vegetation with a high nitrogen demand. The increased availability of atmospheric nitrogen can limit the uptake of other essential nutrients from soils such that vegetation may be affected by reduced levels of potassium and magnesium.

6.4.24 The deposition of acidity due to nitrogen (acidification) can lead to the loss of alkali nutrients (such as calcium, magnesium and potassium) in the soils. Increased ground level concentrations of NOx and the associated deposition effects can increase the rate of acidification that can affect all aspects of the natural environment (i.e. soils, water, flora and fauna).

6.4.25 The deposition of nutrient nitrogen and the acidity due to nitrogen as a result of operation of the Power Generation Plant under all development scenarios will be undertaken in accordance with the EA guidance “AQTAG 06 - Technical Guidance on detailed modelling approach for an appropriate assessment for emissions to air” (2010). Critical loads (to be used as standards for the assessment of significance) will be obtained from the Air Pollution Information Service (APIS).

Air Dispersion Modelling

6.4.26 Air dispersion modelling can predict the ground level concentrations that occur due to the emissions from an elevated stack point source such as the stack(s) to be incorporated as part of the Power Generation Plant. This subsection describes the key aspects of the dispersion modelling process undertaken for the purposes of the EIA.

6.4.27 The flue gases discharged from a stack have two sources of momentum. One is related to the velocity of discharge. This is usually designed to be in excess of 15 m/s as this value has been found to be sufficient to avoid immediate downwash of the plume. Immediate downwash of a plume would not allow for adequate dispersion of the emissions from the stack(s) and could result in significantly elevated ground level concentrations of pollutants in the immediate vicinity of the

stack(s). Whilst contributing to the dispersion of stack emissions, the momentum from the velocity of discharge is soon dissipated.

6.4.28 The second source of momentum is much more significant and is related to the discharge temperature of the flue gases. The flue gases, being warmer than the surrounding atmosphere into which they are discharged, have buoyancy and thus rise. This process continues until the flue gases have cooled to the same temperature as the surrounding air.

6.4.29 Mathematical models are used to calculate the effects of these two sources of momentum and determine the height to which the flue gases will rise. This height plus the height of the stack(s) gives an 'effective stack height'.

6.4.30 The mathematical model then determines the dispersion of the flue gases from this effective stack height. Note that the effective height can be many times greater than the actual stack(s) height as constructed due to the large amount of heat present in the flue gases.

6.4.31 Dispersion occurs as a result of turbulence, and turbulence can result from both buoyancy effects and wind shear (also called mechanical) effects.

6.4.32 As an example of buoyancy effects, on a sunny day, solar heating creates turbulence by heating the ground and the air near the ground. The buoyancy of the heated air causes it to rise, creating turbulence. These are the thermals used by small plane and glider pilots on sunny days. These can also rapidly disperse a plume in the surrounding air. At night, during stable conditions, the buoyancy effect is to suppress rather than cause or enhance turbulence.

6.4.33 Wind shear as a cause of turbulence is well known to pilots as well. Wind shear effects, important to air pollution modelling, result from high (several meters per second) wind speeds near the ground. Since the wind speed at the ground is zero, any high wind speeds result in substantial wind shear. Wind shear dominates over buoyancy effects not only under high wind conditions, but also near the ground under any conditions.

6.4.34 As a result of this, two parameters are used to define the "stability" of the atmosphere. The first is the friction velocity which is a measure wind shear.

6.4.35 The second parameter is a stability term called the Monin-Obukhov length. As mentioned above, shear stress always dominates near the ground. The height above the ground, where buoyancy effects begin to

dominate (generating turbulence in convective conditions or suppressing turbulence in stable conditions) is called the Monin-Obukhov length. This can be thought of as a depth of the neutral (i.e. shear-dominated) flow.

Dispersion Model and Inputs

6.4.36 ADMS 5 was used for the modelling of the dispersion, being a second generation model developed in the UK and accepted by the EA for the purposes of EIA (in addition to Environmental Permit applications).

Wind Turbines

6.4.37 As per consultation responses from MSDC and SCC, the models have incorporated the wind turbines of the Eye Airfield Wind Turbines and the proposed Eye Wind Power Ltd wind farm. This exercise was undertaken for completeness and is currently considered that the presence of such wind turbines have so significant impact on the dispersion of the flue gases under either of the assessed scenarios.

6.4.38 The details of the turbines have been taken from available information with regards to each development and the locations of the turbines included in the model are as presented below:

Eye Airfield Wind Turbines

- Turbine 1 Grid Reference: TM 13118 75460
- Turbine 2 Grid Reference: TM 12988 75042

Eye Wind Power Ltd

- Turbine 1 Grid Reference: TM 12991 74575
- Turbine 2 Grid Reference: TM 13277 74817

Building Downwash

6.4.39 Building downwash is created by structures in the vicinity of an emissions source and subjects the plume from the stack(s) to wake effects. The effect is generally to pull the plume down to the ground at locations closer to the stack(s) thereby restricting the dispersion of the plume and increasing the ground level concentration of pollutants and, potentially, the environmental impact of the Power Generation Plant.

6.4.40 The potential development scenarios, as discussed in Section 3 of this document, mean that different combinations of on-site structures could be present during operation. The buildings that form part of the

modelled scenarios and included in the modelling exercise are shown in Table 6.3 and Table 6.4.

Table 6.3 - Model Inputs – 5 x c.60 MW units

Building	Height (m)	Width (m)	Length (m)
Turbines	5	5	20
Administration Building	10	10	15
Warehouse	10	15	35

Table 6.4 - Model Inputs – 2 x c.150 MW units

Building	Height (m)	Width (m)	Length (m)
Turbines	8	10	12
Administration Building	10	10	15
Warehouse	10	15	35

6.4.41 All buildings are assumed to be located as in the indicative layouts shown in Figures 6.2. The downwash effects of buildings are considered to be potentially significant if they are within a distance from the stack(s) equivalent to five times the building height and if the building height is greater than 40 per cent of the stack height. As such, any changes to the layout of the above buildings are not likely to significantly alter the results of the model however the buildings are included for completeness.

Receptors and Additional Model Data

6.4.42 The ADMS model calculates time averaged ground level concentrations over any set of distances from the source. The study used a 20 km by 20 km Cartesian grid with 200 m spacing to predict the process contributions to ground level concentrations in the immediate vicinity of the proposed stack location. This grid was centred on the proposed centre points of the stacks (in either scenario) at approximate grid reference TM 152 751 (as per Figures 6.2 and 6.3).

6.4.43 The meteorological data used for this modelling exercise was that from the station at Wattisham (approximate National Grid Reference TM 89 42); it is considered that this data will be representative of the conditions experienced at the site following consultation with the Met Office (who supplied the data). The data period considered was 2008-2012 inclusive as per current EA guidelines for the consideration of

recent meteorological data over five consecutive years. For each year the predominant wind direction was from the south west. The wind rose for 2009 can be seen in Figure 6.1.

6.4.44 Terrain effects generally occur when ground levels within 1 km of the stack(s) vary by more than a third of the stack height. Given the range of stack heights that have been considered as part of the stack height sensitivity study, Ordnance Survey Landform Panorama Digital Terrain Mapping (DTM) terrain data has been included in the dispersion modelling exercise.

Fuel-specific Dispersion Model Inputs

6.4.45 Modelling will assume that the Power Generation Plant operates at full load for 1500 hours per year i.e. the maximum possible operation of the proposed Project.

6.4.46 All emissions from the combustion of the fuel gases will be discharged from the stack(s). Based on the available anticipated emissions data, the stack diameter was optimised to ensure that the efflux velocity was at least 25 m/s.

6.4.47 Different combustion arrangements (i.e. number and type of GTs) may be utilised and each such scenario will result in flue gases from the differing number of stacks having different properties. The dispersion modelling inputs for each scenario are shown in Table 6.5 and Table 6.6.

Table 6.5 - Model Inputs – 5 x c.60 MW units

Parameter	Units	Value (per unit)
Normal flue gas flow rate	Nm3/s	129.1
NO_x emission level	mg/Nm3	50
NO_x flow rate	g/s	6.5
CO emission level	mg/Nm3	100
CO emission rate	g/s	12.9
Temperature	°C	463
Actual flue gas volume	m3/s	346.4
Oxygen content	% volume (wet)	13.6
Flue gas velocity	m/s	25
Stack diameter	m	4.2

*Normalised volumes corrected to 273.15 K, 1 atm and 15 per cent oxygen w/w (dry)

Table 6.6 - Model Inputs – 2 x c.150 MW units

Parameter	Units	Value (per unit)
Normal flue gas flow rate	Nm^3/s	339.1
NO_x emission level	mg/Nm^3	50
NO_x flow rate	g/s	20.0
CO emission level	mg/Nm^3	100
CO emission rate	g/s	39.9
Temperature	°C	534
Actual flue gas volume	m^3/s	1229.8
Oxygen content	% volume (wet)	13.9
Flue gas velocity	m/s	25
Stack diameter	m	7.9

*Normalised volumes corrected to 273.15 K, 1 atm and 15 per cent oxygen w/w (dry)

Conversion of Oxides of Nitrogen to Nitrogen Dioxide

6.4.48 NOx emissions from the Power Generation Plant will consist of the gases NO and NO_2. It is only NO_2 that is of concern in terms of direct health effects; however NO is a source of NO_2 in the atmosphere. The

gases are in equilibrium in the air, with NO predominating at the stack exit. The equilibrium changes as the plume disperses and is exposed to oxidants, such as atmospheric ozone. The rate of conversion of NO to NO_2 increases with rising ozone concentration and wind speed (turbulence and mixing effects) whilst the level of solar radiation controls the rate of the reverse dissociation reaction of NO_2 to NO.

6.4.49 For assessing the impacts on air quality of emissions to atmosphere from sources, such as power stations, it is important that realistic estimates are made of how much NO would be oxidised to NO_2 at all receptors considered.

6.4.50 The rate of oxidation of NO to NO_2 depends on both the chemical reaction rates and the dispersion of the plume in the atmosphere. The oxidation rate is dependent on a number of factors that include the prevailing concentration of ozone, the wind speed and the atmospheric stability.

6.4.51 Conversion factors are recommended for a screening / worst case approach by the EA AQMAU and their "Horizontal Guidance Note H1 – Annex (f)" (April 2010). The guidance states that an initial air quality assessment should be undertaken based on 50 per cent conversion of the short-term average NOx concentrations and 100 per cent conversion of the long-term averages.

6.4.52 However, in order to determine the true impact of operation it is important that a realistic estimate of the actual process contribution to ground level concentrations of NO_2 is made.

6.4.53 Between 1975 and 1985 about 60 sets of measurements were taken of the concentrations of nitric oxide and nitrogen dioxide in plumes from a variety of power stations. These measurements were carried out under widely varying weather conditions at altitudes between 200 m and 700 m. From the data collected, an empirical relationship for the percentage oxidation in a power station plume based on downwind distance, season of the year, wind speed and ambient ozone concentration may be described by the following equation (which is sometime referred to as Janssen's equation):

$$NO_2 / NO_x = A\left(1 - \exp^{(-\alpha x)}\right)$$

where x is the distance downwind (km) of the emission point and α and A are constants dependent on time of year and derived from the measurements of wind speed and ozone concentrations.

6.4.54 For a typical power station the peak ground level concentration of the oxides of nitrogen will occur within a few kilometres. Table 6.7 shows the minimum, maximum and annual average estimates of NO_2 in the plume for selected distances downwind of the plume, the figure takes into account the ratio of NO to NO_2 in the plume on exit from the stack and assumes that there is sufficient ozone present to achieve equilibrium of the conversion reaction, as a worst case.

Table 6.7 - Estimates of the Percentage of NO_2 in NOx

Downwind Distance (km)	Percentage NO2		
	Lowest One Hour Average	Highest One Hour Average	Annual Average
1	5.9	16.0	9.3
2	11.4	29.0	17.5
3	16.5	39.7	24.7
5	25.7	55.6	36.5
10	43.8	76.1	56.1

6.4.55 Given the figures in the above table it is considered that the application of the 50 per cent / 100 per cent NOx conversion factors represents a significant over-estimation of the actual maximum increments to ground level concentrations of NO_2 as a result of operation of the Power Generation Plant. Therefore the conversion factors from the above Table have been applied.

Stack Height

6.4.56 The stack height sensitivity study examined differing stack heights in 10 m intervals from 20 m to 80 m (inclusive). The stack height sensitivity considered long term and short term contributions to ground level concentrations of NO_2.

6.4.57 The stack height modelling results have been compared against the UK AQS objectives. The modelling results can be considered to be “significant” if the ground level concentrations exceed 10 per cent of the short term objectives / EAL (up to 24 hour averages) and 1 per cent of the long term objectives / EAL (monthly / annual results etc.).

6.4.58 It is assumed that the plant is operating at full load for 1500 hours per annum therefore the worst case scenario has been considered.

6.4.59 The stack height study predicted the 19th highest hourly and annual NO_2 ground level concentrations as a result of the operation of the Power Generation Plant. The 19th highest hourly value is obtained with regard to the compliance requirements of EU and UK legislation and allows for abnormal weather conditions which may only occur for one hour during the year to be disregarded as these weather conditions cannot be mitigated for in any significant way.

Significance Criteria

Construction / Decommissioning

6.4.60 Table 6.8 outlines the matrices defined in the IAQM Guidelines for the four types of activity identified in Paragraph 6.4.7 (and defined in Paragraph 6.4.9). The matrices are used, for consent/decommissioning, as a proxy for "magnitude" (as per the methodology described in Section 3).

6.4.61 Table 6.9 provides examples for the determination of the sensitivity of a receptor.

6.4.62 Table 6.10 outlines the magnitude criteria that have been used to assess the significance of potential air quality impacts during construction which has been taken from the IAQM Guidance. The significance level is then used as a direct link to the mitigation requirements outlined in 'The control of dust and emissions from construction and demolition Best Practice Guidance' (Greater London Authority, 2006).

Table 6.8 - Risk Categories

Risk Category – Demolition				
Distance to Receptor (m)		Dust Emissions Class		
Human Health / Disturbance	Ecological Sites	Large	Medium	Small
<20	-	High	High	Medium
20-100	<20	High	Medium	Low
100-200	20-40	Medium	Low	Low
200-350	40-100	Medium	Low	Negligible
Risk Category – Earthworks				
Distance to Receptor (m)		Dust Emissions Class		
Human Health / Disturbance	Ecological Sites	Large	Medium	Small
<20	-	High	High	Medium
20-50	-	High	Medium	Low
50-100	<20	Medium	Medium	Low
100-200	20-40	Medium	Low	Negligible
200-350	40-100	Medium	Low	Negligible
Risk Category – Construction				
Distance to Receptor (m)		Dust Emissions Class		
Human Health / Disturbance	Ecological Sites	Large	Medium	Small
<20	-	High	High	Medium

20-50	-	High	Medium	Low
50-100	<20	Medium	Medium	Low
100-200	20-40	Medium	Low	Negligible
200-350	40-100	Medium	Low	Negligible
Risk Category – Trackout				
Distance to Receptor (m)		Dust Emissions Class		
Human Health / Disturbance	Ecological Sites	Large	Medium	Small
<20	-	High	Medium	Medium
20-50	<20	Medium	Medium	Low
50-100	20-100	Low	Low	Negligible

Table 6.9 - Sensitivity of a Receptor

Sensitivity	Human Receptor	Ecological Receptor
Very High	Very densely populated area. More than 100 dwellings within 20 m. Local PM10 concentrations exceed the objective. Contaminated buildings present. Very sensitive receptors (e.g. oncology units). Works continuing in one area of the site for more than one year.	European Designated Site
High	Densely populated area. 10-100 dwellings within 20 m of site. Local PM10 concentrations close to the objective (e.g. annual mean 36-40 µg/m3). Commercially sensitive horticultural land within 20 m.	National Designated Site
Medium	Suburban or edge of town area. Less than 10 dwellings within 20 m. Local PM10 concentrations below the objective (e.g. annual mean 30-36 µg/m3).	Local Designated Site
Low	Rural area; industrial area No dwellings within 20 m Local PM10 concentrations well below the objectives (less than 75%) Wooded area between site and receptors	No Designation

Table 6.10 - Significance Criteria for Construction / Decommissioning

Sensitivity	Risk Category		
	High	**Medium**	**Low**
Very High	Severe	Major	Moderate
High	Major	Moderate	Minor
Medium	Moderate	Minor	Not Significant
Low	Minor	Not Significant	Not Significant

Operation

6.4.63 Whilst noting that the stack height sensitivity studies has been undertaken in accordance with the significance criteria set out in Paragraph 6.4.48, more detailed analysis will be undertaken for the resultant impacts as the EIA progresses.

6.4.64 In terms of NOx, the significance criteria adopted for the operational air quality impacts in this assessment have been derived from the criteria suggested by Environmental Protection UK in their document 'Development Control: Planning for Air Quality' (2010).

6.4.65 Firstly, the magnitude of potential impact is determined via Table 6.11.

Table 6.11 - Establishing the Magnitude of the Potential Impact

Magnitude	Increase in Annual Mean NO2 (µg/m3)	[7]Increase in Days NO2 >200 µg/m3 *
Very Large	n/a	>14 days
Large	>4	8-14 days
Medium	2 – 4	5-8 days
Small	0.4 – 2	3-5 days
Very Small	n/a	1-3 days
Extremely Small	<0.4	<1 day

**Note: 18 days of exceedances are permitted under the NAQS in any one year*

6.4.66 The magnitude of the potential impact is then compared against the absolute concentration relative to AQS Standard / Objective to determine the significance via Table 6.12.

[7] Retained from 2006 guidance as no standard is included in 2010 update

6.4.67 These significance criteria are applied for the purposes of this impact assessment. However, the AQS method does not distinguish between processes or the extent of the area of impact. Therefore it is important that the results are interpreted qualitatively as well as quantitatively. It is noted that this standard industry methodology does not include provision for the definition of sensitivity of receptors. However the methodology has been prepared in order to assist local planning authorities in assessing the significance of air quality impacts and is thus an accepted method for the assessment of air quality impacts.

6.4.68 For the purposes of the EIA for the proposed Project, the threshold of significance is defined as those impacts anticipated to be of moderate significance or greater.

Table 6.12 - Establishing the Significance of the Predicted Impact

Absolute Concentration in relation to Standard / Objective	Magnitude					
	Extremely Small	**Very Small**	**Small**	**Medium**	**Large**	**Very Large**
Above Standard without Project	Minor	Minor	Major	Major	Severe	Severe
Below Standard without Project and Above with Project	Minor	Moderate	Major	Major	Severe	Severe
Below Standard with Project, but not Well Below*	Not Significant	Minor	Minor	Moderate	Moderate	Major
Well Below Standard with Project	Not Significant	Not Significant	Minor	Minor	Minor	Moderate

* Note: Well below the standard = <75% of the standard level

'Standard' relates to the specific air quality objective

6.5 Embedded Design Mitigation

6.5.1 The proposed Project has been designed from the outset to ensure its impacts are minimised. This includes mitigation that is embedded into the design of the Power Generation Plant, Gas Connection and Electrical Connection and industry standard methods and procedures to ensure impacts from construction, operation and decommissioning are minimised.

6.5.2 During operations, emissions of NOx will be limited to less than 50 mg/Nm3 at outputs above 70 per cent load in accordance with the IED and the BAT AEL for the firing of natural gas in GTs. This will be ensured by the use of Dry Low NOx burners (or better). This is in accordance with the current EA Sector Guidance Note for Combustion and the EU IPPC Reference Document on Best Available Techniques for Large Combustion Plants.

6.5.3 During construction, mitigation measures would be covered by the Construction Environmental Management Plant (CEMP) that will apply to each of the key elements of the proposed Project. The CEMP will incorporate appropriate dust mitigation measures (such as covering stockpiles or dowsing with water during dry, windy conditions) that will be approved by the relevant authorities and adopted, such that it would be unlikely (under most weather conditions) that any dust generated at the site has the potential to cause nuisance to any sensitive receptors in the area.

6.5.4 Mitigation for the Gas Connection, Electrical Connection Compound and Electrical Connection will be determined following the finalised assessment of construction / decommissioning impacts to air quality and described in the final ES. Such mitigation will form part of the CEMP and be secured by the DCO.

6.5.5 The assessment in this Section takes such design mitigation into account. Any additional mitigation developed in response to specific impacts identified in this assessment is described in paragraph 6.9 below.

6.5.6 The Eye Airfield Industrial Estate and the Mid Suffolk Business Park, as well as agricultural holdings, are immediately adjacent to the Project Site. PPL will continue to consult with the potentially affected neighbours and will require its contractors to implement a comprehensive dust suppression / mitigation and monitoring programme. This will prevent construction work generating levels of atmospheric dust which would constitute a health hazard or nuisance to local people or industry.

6.6 Consultation

6.6.1 Table 6.13 below provides a list of scoping consultation responses relating to the Air Quality assessment and illustrates how each response has been addressed.

Table 6.13 – Scoping Responses

Reference	Comment	Actions
PLANNING INSPECTORATE		
3.15	The SoS recommends that assessment methodology is determined in consultation with EA, Natural England (NE) and the relevant local authorities; including the study area and sensitive receptors. The SoS notes that the air quality baseline will be defined using available existing baseline monitoring data.	The EIA will adopt EA guidance (AQTAG06) for the assessment of deposition impacts to sensitive ecological receptors. General air quality impacts are being assessed in accordance with relevant guidelines as per the methodology presented in this section.
3.16	It is noted that the air quality modelling and assessment will consider impacts at European designated and other ecological sites within 10km of the proposed development. There is also a need for the ES to consider potential effects due to an increase in airborne pollution during construction, including fugitive dust emissions, on other important nature conservation and wildlife sites. The approach to this assessment should be agreed with NE.	The proposed assessment of fugitive dust emissions from construction is being undertaken in preparation of the final ES and will consider the impact on ecological receptors within the study area, as outlined in the methodology presented in this section.
3.17	The SoS welcomes the approach of using Atmospheric Dispersion Modelling to assess the effects of significant pollution emissions. All assumptions and limitations to assessments, including the number, location and height of flue stacks should be clearly specified in all relevant sections of the ES.	The assumptions for / description of the anticipated emissions from the Project are outlined in the methodology presented in this section.

3.18	If details including the number, location and height of the flue stacks are not confirmed at the point of application the ES should assess operational air quality based on a worst case scenario taking into account other nearby pollution sources (existing and proposed). The implications of stack height and dispersion of the discharge should also be clearly explained.	Locations of the stack(s) will be provided in the final ES however the height and number are discussed in the methodology presented in this section.
3.19	Predicted pollutant concentrations should be assessed against the applicable standard guideline value (e.g. relevant European air quality limit values and National Air Quality Objectives).	The relevant guideline values are presented in the legislative and policy context present in this section. .
3.21	The assessment should take account of the air emissions from the proposed development and emissions related to increased vehicular movements associated with the proposed development. Such information should also inform the ecological assessment.	Emissions from vehicle are being assessed in accordance with the guidance / methodology from the Department for Transport as outlined in the methodology presented in this section.
3.22	Changes in air quality and dust levels should be assessed not only on site but also off site, including along access roads, local footpaths and other PROW. The SoS welcomes the proposal to assess the gas and the electrical connections for construction and decommissioning impacts on air quality.	The proposed assessment of fugitive dust emissions from construction is being undertaken in preparation of the final ES and is considering the effects / impacts of dust along access roads as outlined in the methodology presented in this section.
3.23	Consideration should be given to appropriate mitigation measures and to monitoring dust complaints.	Mitigation measures will be determined following completion of the proposed assessment of fugitive dust emissions during construction and presented in the

		final ES, as per the methodology presented in this section.
3.33 & 3.66	Cross reference air quality (including dust) with ecology, noise, vibration, water management, and traffic & Infrastructure.	Relevant references will be incorporated in the final ES.
SUFFOLK COUNTY COUNCIL		
79	The air quality assessment will need to consider carbon dioxide emissions in the terms described in EN-1 (5.2.2).	The final ES will present an assessment of CO2 as per the requirements of the NPS.
MID SUFFOLK DISTRICT COUNCIL		
	The overall approach to the assessment of air quality issues is acceptable however the Scoping Report makes reference to reliance upon local authority data. The applicant needs to be made aware that there is a paucity of air quality data which will have to be addressed.	This point is noted, however it is considered that there is sufficient local authority data (supplemented by information held by DEFRA) in order to undertake a suitable and robust assessment. Full details will be provided within the final ES.
	The existing and proposed wind turbines within the area will need to be taken into account in order to assess their impact upon dispersion models. Likewise the existing biomass plant and other energy from waste proposals will need to be factored into the dispersion modelling in order to assess the cumulative impact of the scheme.	The existing and proposed wind turbines have been included in the air dispersion models as discussed in the methodology presented in this section.
	In terms of receptor locations the applicant will need to establish that there are no unimplemented planning permissions within the vicinity that may have an impact upon the modelling.	This will be determined through the on-going consultation process.
	It is also requested that the ES outlines how the proposed plant will secure a reduction in carbon emissions within the region over	CO2 emissions will be assessed in accordance with the relevant NPS

	its lifetime and whether it will have any micro climatic effects.	and the results presented in the final ES.
NATURAL ENGLAND		
	Air quality in the UK has improved over recent decades but air pollution remains a significant issue; for example over 97% of sensitive habitat area in England is predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition (England Biodiversity Strategy, Defra 2011). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The planning system plays a key role in determining the location of developments which may give rise to pollution, either directly or from traffic generation, and hence planning decisions can have a significant impact on the quality of air, water and land.	Noted
	In terms of assessing the impact on air quality, we advise that a radius of 10km around the application site is searched for international and European designated sites (i.e. SPAs, SACs and Ramsar sites) and a radius of 2km for nationally designated sites (i.e. SSSIs). Nonstatutory local sites (e.g. County Wildlife Sites) near to the application should also be considered. The assessment should take account of the risks of air pollution and how these can be managed or reduced. Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (www.apis.ac.uk). Further information on air pollution modelling and assessment can be found on the Environment Agency website.	The assessment of operational air quality impacts will be in accordance with industry standard guidance (principally from the EA) as per the methodology section. In particular, the AQTAG06 methodology for the assessment of deposition impacts is being followed and baseline data sourced from the APIS records.
YAXLEY PARISH COUNCIL and THRANDESTON PARISH COUNCIL		

1	The area covered by assessments relating to Noise & Vibration should have a minimum radius of 2 kilometres; for **Air Quality**, Ecology, Water Resources a minimum radius of **5 kilometres**;	The air quality assessment is considering a study area of 10km radius from the proposed stack(s) as outline in the methodology presented in this section.
	Assessments should quantify the likely impact on growing crops, open water and its wildlife, herbivorous wildlife and insects, especially pollinators. Yaxley Allotment is very close to the development and its users will expect any reassurances to be backed by reliable evidence.	The potential air quality and deposition impacts to sensitive ecological receptors will be presented in the final ES.
	Although the vulnerability of the local area needs to be assessed, will the surveys yield information on the wider dispersal by the prevailing winds, for example south-westerlies blowing along the Waveney Valley carrying emissions towards the coast?	As above, the air quality assessment is considering a study area of 10km radius from the proposed stack(s) and terrain effects for the entire study area have been included in the model, as per the methodology presented in this section.
	Consideration should be given to assessing the particular impact on ecologically sensitive areas, including The Marsh at Thrandeston and all other land in the area that is managed under stewardship agreements with Natural England.	A full list of potentially sensitive ecological receptors will be developed through consultation with the relevant stakeholders and the assessment will be presented in the final ES.
	The emissions should be evaluated in the context of the area's committed carbon reduction target.	CO2 emissions will be assessed in accordance with the relevant NPS and the results presented in the final ES.

6.7 Baseline Conditions and Receptors

Study Area

6.7.2 The IAQM Guidelines states that: “An assessment will normally be required where there are sensitive receptors within 350 m of the boundary of the site and / or within 100 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).”

6.7.3 The Study Area is shown in Figure 6.2.

Air Dispersion Modelling

6.7.4 The Study Area for the air quality impact assessment is shown in Figure 6.3. This is based on a 20 km by 20 km grid, as explained in Section 6.3 – Assessment Methodology and Significance Criteria. It contains the following receptors:

- The residential settlements nearest to the Power Generating Plant are Brome, Eye and Yaxley, as described in Section 3.2 and shown on Figure 6.3. These are especially relevant as local residences or areas where people are present for a large percentage of the time;
- Sensitive ecological receptors within 10 km of the Project Site including:
  - European and Nationally Designated Sites, shown on Figure 6.3;
- Business / industrial occupiers nearest to the Power Generation Plant (Eye Airfield Industrial Estate, Mid Suffolk Business Park) and local agricultural holdings.

Baseline Conditions

6.7.5 The baseline data is dependent on recent monitoring and other currently available information within the Study Area.

6.7.6 MSDC does not operate any automated air quality monitors however measurements are available from five diffusion tube locations which monitor concentrations of NO2. The air quality monitoring results are presented in Table 6.14.

6.8 Table 6.14 - Annual Averages of NO_2 (µg/m3)

Location	2008	2009	2010
Gipping Way 1, Stowmarket	39.3	42.1	36.1
Gipping Way 2, Stowmarket	N/A	N/A	35.9
Station Road West, Stowmarket	31.1	32.9	30.7
Crown Street, Stowmarket	20.2	20.9	20.6
Poplar Hill, Stowmarket	23.7	26.7	Discontinued
Old Stowupland Road, Stowmarket	29.2	32.6	33.1
High Street, Needham Market	26.9	29.9	26.5

Source: 2011 Air Quality Progress Report for Babergh District Council and MSDC

6.8.1 MSDC undertook an Updating and Screening Assessment (USA) of ambient air quality within its jurisdiction in April 2011. The USA for MSDC (2011) states that:

6.8.2 "The Air Quality Objectives have not been exceeded in the Mid Suffolk district in 2010. There was however an exceedance of the Annual Mean Objective for nitrogen dioxide at one location in 2009 and as a consequence, additional monitoring was undertaken in the area. However, it has since been established that the diffusion tubes at the location of the 2009 exceedance were not located in accordance with the guidance in LAQM.TG (09). A review of air quality monitoring in Mid Suffolk to ensure that all monitoring locations meet best practice, as defined in LAQM.TG (09), is currently being undertaken.

6.8.3 It was also proposed that further monitoring should have been undertaken in 2011 in the vicinity of the junction at Gipping Road/Station Road, Stowmarket, which is in the locality of the potential exceedance, to determine the scale of any issues within the area at relevant receptors."

6.8.4 It is noted that the above monitoring locations are all outside of the air dispersion modelling study area. The USA Report continues that: "There are no other areas that are of concern within the area of MSDC."

6.9 Preliminary Assessment of Potential Impacts

POWER GENERATION PLANT

Construction

6.9.2 During all construction works the main potential impact on air quality arising from construction activities will be due to:

- Airborne particulate matter (or dust) emissions from on-site construction activities; and
- Emissions of NO_x from construction traffic movements.

Airborne Particulate Matter

6.9.3 Dust could be emitted during several activities associated with the construction works should preventative measures not be taken. Dust could arise from: earth moving operations for site levelling (albeit this is expected to be minimal), back filling and foundations; removal of spoil, site stripping, blow-off and spillage from vehicles; concreting operations, site reinstatement and road construction and during wind blow over bare dry construction areas.

6.9.4 Only with high wind speeds would long distance transport of dust and the potential for soiling of buildings occur. In these conditions more dust would also be created at source. The extent of any such emissions of dust is very dependent on wind speed, ground conditions, the prevalence of hot, dry conditions and the use of preventative measures.

6.9.5 As per the study area shown in Figure 6.2, there are understood to be no residential properties within the zone of influence of dust emissions from the construction site; the nearest housing is 480 m east of the Power Generation Plant boundary, to the east of the Mid Suffolk Business Park. However local public rights of way pass through the areas potentially affected by dust emissions from the site as shown in Figure 6.2.

Construction Traffic Emissions

6.9.6 The impacts of atmospheric emissions from road vehicles upon local pollution levels is a function of the number and type of vehicles together with the vehicle speed as it passes any particular receptor. For

example, local air quality will be degraded more by a vehicle that is stationary and idling compared with a vehicle travelling passed a receptor at 70 miles per hour (mph).

6.9.7 The potential for the significance of atmospheric emissions from construction traffic is dependent upon the presence of nearby receptors and thus members of the population who may be adversely affected by them. The contribution of vehicle emissions diminishes quickly with distance such that their influence on local pollutant concentrations is considered not significant at distances greater than 200 m (Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3, Part 1: Air Quality). The number of potential receptors within this 200 m zone of influence is limited and it is noted that this is a generic assumption with the zone of influence likely to be reduced following a quantitative analysis of the emissions from road traffic.

6.9.8 On-site emissions levels from construction traffic at any one location within the site will vary as different combinations of plant machinery are used, and throughout the construction phase of the proposed Project as the on-site staffing levels and the construction activities / locations change. A worst case scenario would be for any construction traffic to be idling at the boundary of the site which, as above, could impact on local air quality.

Operation

6.9.9 The following scenarios are relevant to the air quality impact assessment of the operation of the Power Generation Plant:

- Operation of five aero-derivative units (each of c.60 MW)
- Operation of two industrial units (each of c.150 MW)

6.9.10 During operation, the Power Generation Plant will produce the principal emissions to air from the stack associated with each GT.

6.9.11 To determine the pollutants that should be considered as part of the more detailed dispersion modelling exercise, calculations have been undertaken using existing EA guidance based on the anticipated worst case emissions rates during normal operation and additional emissions parameters. The results of these calculations showed that the emissions of most interest from the new plant are those of NOx. It should be noted however, that only a proportion of the NOx released will be converted to the more harmful NO_2 pollutant.

6.9.12 Combustion in GTs is conducted at high excess air rates, typically 200-300 per cent excess air which provides conditions as close to complete combustion as possible. There are, therefore, very low levels of CO or

unburned hydrocarbons present in the products of combustion when burning natural gas.

6.9.13 The combustion of natural gas therefore results in the emission of flue gases containing CO_2, H2O, O, N, CO and NOx.

6.9.14 The effect of the emissions of carbon monoxide is not anticipated to be significant however these will be examined further as part of the on-going EIA.

Modelling Results

6.9.15 A conservative view of the operation of the Power Generation Plant has been adopted in the modelling so that a "worst case" is presented. The purpose of using this approach is to ensure that the absolute maximum predicted impact within the potential operating regime of the proposed Power Generation Plant is considered.

Table 6.15 Short-Term Stack Height Sensitivity for NO_2

Stack Height	19th Highest Hourly Average (µg/m3)	
	5 x c.60 MW Units	2 x c.150 MW Units
20	3.2	2.1
30	2.5	1.8
40	2.2	1.6
50	1.9	1.4
60	1.7	1.2
70	1.5	1.0
80	1.4	1.0

Table 6.16 - Long-Term Stack Height Sensitivity for NO_2

Stack Height	Annual Average (µg/m^3)	
	5 x c.60 MW Units	2 x c.150 MW Units
20	0.06	0.03
30	0.05	0.03
40	0.04	0.02
50	0.04	0.02
60	0.03	0.02
70	0.03	0.02
80	0.02	0.01

6.9.16 The above Tables indicate that, based on the screening level assessment recommended by the EA, the process contribution to annual average ground level concentrations will be less than the EA threshold of significance of:

- 1 per cent of the long-term AQS objective (40 µg/m^3); or
- 10 per cent of the short-term AQS objective of (200 µg/Nm^3),

for any stack height considered within the sensitivity study.

6.9.17 Therefore, the potential impact on local air quality can be considered to be not significant.

6.9.18 It is considered that a stack height of 20 m will provide adequate dispersion of the flue gases (irrespective of the type, and associated number, of GTs / stacks) though 30 m is considered within the Project Description for the purposes of this PEIR.

Decommissioning

6.9.19 During decommissioning, temporary air quality impacts are likely to arise. These will be similar to those described above for construction.

GAS CONNECTION ROUTE CORRIDOR OPTION 1

Construction

6.9.20 As discussed in relation to construction of the Power Generating Plant, the assessment of air quality relating to construction of the Gas Connection will be in accordance with the IAQM Guidelines with mitigation measures defined through the appropriate use of risk

assessments for the works required and the associated definition of mitigation measures for the control of emissions of airborne particulate matter.

6.9.21 As per the IAQM Guidelines, the study area for construction works is (for human receptors) all land within a distance of 350m of the boundary of the route corridor (100 m for trackout, and up to 500 m from a 'construction site' access / egress). For ecological receptors, this distance is 100m.

6.9.22 The IAQM Guidelines state:

6.9.23 "Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is a low, medium or high risk site. Mitigation measures for London are set out in The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance [GLA Guidance], published in 2006... Most of these measures are likely to be suitable for demolition / construction projects outside the capital.

6.9.24 For those cases where the risk is assigned as 'negligible', no mitigation measures beyond those required by legislation are required."

6.9.25 The mitigation measures are yet to be determined but will be defined based on the appropriate requirements of the GLA Guidance and included in an Outline CEMP that will accompany the proposed DCO Application. This mitigation will thus be 'embedded' into the construction methods to be used.

6.9.26 The IAQM Guidance presents a matrix for the assessment of post-mitigation significance for the potential impacts. The maximum mitigated impact will therefore be "slight adverse" which is equivalent to "Minor Significance" in accordance with the terminology used in the ES. Therefore the maximum potential impact of the construction of the Gas Connection will be of Minor Significance.

Operation

6.9.27 Emissions during the operational phase of the Gas Connection, which may potentially include infrequent emissions of natural gas, are expected to be minimal and limited to infrequent venting of gas from the AGI under, non-normal, maintenance or emergency conditions. The potential air quality impacts of operation of the Gas Connection are thus considered to be Not Significant.

Decommissioning

6.9.28 During decommissioning, it is possible that the AGI would be dismantled and removed. Under current proposals, no major civil works would be required and therefore dust migration and emissions from on-site equipment and associated vehicles would be no greater than the predicted impacts during construction. Therefore, the assessment for impacts related to earthworks and trackout are considered to be as for construction and, thus, will be of no more than Minor Significance using embedded mitigation as defined by the GLA Guidance.

GAS CONNECTION ROUTE CORRIDOR OPTION 2

Construction

6.9.29 The methods of the construction will be similar to those described above (for Gas Connection Route Corridor One).

6.9.30 As per the IAQM Guidelines, the study area for construction works is (for human receptors) is all land within a distance of 350m of the boundary of the route corridor (100 m for trackout, and up to 500 m from a 'construction site' access / egress). For ecological receptors, this distance is 100m.

6.9.31 The mitigation measures are yet to be determined but will be defined based on the appropriate requirements of the GLA Guidance and included in an Outline CEMP that will accompany the proposed DCO Application. This mitigation will thus be 'embedded' into the construction methods to be used.

6.9.32 The IAQM Guidance presents a matrix for the assessment of post-mitigation significance for the potential impacts. The maximum mitigated impact will therefore be "slight adverse" which is equivalent to "Minor Significance" in accordance with the terminology used in the ES. Therefore the maximum potential impact of the construction of the Gas Connection will be of Minor Significance.

Operation

6.9.33 Emissions during the operational phase of the Gas Connection, which may potentially include infrequent emissions of natural gas, are expected to be minimal and limited to infrequent venting of gas from the AGI under, non-normal, maintenance or emergency conditions. The potential air quality impacts of operation of the Gas Connection are thus considered to be Not Significant.

Decommissioning

6.9.34 During decommissioning, it is possible that the AGI would be dismantled and removed. Under current proposals, no major civil works would be required and therefore dust migration and emissions from on-site equipment and associated vehicles would be no greater than the predicted impacts during construction. Therefore, the assessment for impacts related to earthworks and trackout are considered to be as for construction and, thus, will be of no more than Minor Significance using embedded mitigation as defined by the GLA Guidance.

ELECTRICAL CONNECTION COMPOUND OPTION 1 AND ELECTRICAL CONNECTION CORRIDOR OPTION 1

Construction

6.9.35 The excavation of trenches has the potential to generate small amounts of airborne particulate matter that are being assessed in accordance with the IAQM Guidelines in order to determine suitable mitigation measures such that any potential impacts will be of Minor Significance or less.

6.9.36 The construction of the Electrical Connection Compound, the main potential impact on air quality arising will be due to, airborne particulate matter (or dust) emissions from on-site construction activities; and emissions of NOx from construction traffic movements as described for the Power Generation Plant.

Operation

6.9.37 There is a very limited scope for potential impacts on air quality relating to the operation of the Electrical Connection Compound and the Electrical Connection. Should there be a need for excavation of the buried cables, this will have the potential for the generation of airborne particulate matter and, as per the impacts for construction, will be of no more than Minor Significance following the implementation of appropriate mitigation measures as per the GLA Guidelines.

Decommissioning

6.9.38 The decommissioning of the proposed Project, and specifically the Electrical Connection, will likely see the buried cables disconnected and grounded and left in-situ.

6.9.39 The Electrical Connection Compound may be retained in order to maintain the potential for future electrical connections to the NETS in the area. Should the Electrical Connection Compound be dismantled,

the impacts would be similar to the construction phase and will be assessed accordingly in order to define the 'embedded' mitigation that will form part of an appropriate Environmental Management Plan for the decommissioning/demolition works.

6.9.40 The potential impacts to air quality will thus be of Minor Significance or less.

ELECTRICAL CONNECTION COMPOUND OPTION 2 AND ELECTRICAL CONNECTION CORRIDOR OPTION 2

Construction

6.9.41 The excavation of trenches has the potential to generate small amounts of airborne particulate matter that will be assessed in accordance with the IAQM Guidelines in order to determine suitable mitigation measures such that any potential impacts will be of Minor Significance or less.

6.9.42 The construction of the Electrical Connection Compound, the main potential impact on air quality arising will be due to, airborne particulate matter (or dust) emissions from on-site construction activities; and emissions of NOx from construction traffic movements as described for the Power Generation Plant.

Operation

6.9.43 There is a very limited scope for potential impacts on air quality relating to the operation of the Electrical Connection. Should there be a need for excavation of the buried cables, this will have the potential for the generation of airborne particulate matter and, as per the impacts for construction, will be of no more than Minor Significance following the implementation of appropriate mitigation measures as per the GLA Guidelines.

Decommissioning

6.9.44 The decommissioning of the Electrical Connection will likely see the buried cables disconnected and grounded and left in-situ.

6.9.45 The Electrical Connection Compound may be retained in order to maintain the potential for future electrical connections to the NETS in the area. Should the Electrical Connection Compound be dismantled, the impacts would be similar to the construction phase and will be assessed accordingly in order to define the 'embedded' mitigation that will form part of an appropriate Environmental Management Plan for the decommissioning/demolition works.

6.9.46 The potential impacts to air quality will thus be of Minor Significance or less.

6.10 Preliminary Assessment of Residual Impacts

Table 6.17 – Preliminary Assessment of Residual Impacts

Project Element	Construction	Operation	Decommissioning
Power Generation Plant	Airborne Particulate Matter / Dust emissions Minor Significance (or less)	Process contribution to ground level concentrations of NOx and CO Not Significant	Airborne Particulate Matter / Dust emissions Minor Significance (or less)
Gas Connection Route Corridor One	Airborne Particulate Matter / Dust emissions Minor Significance (or less)	Intermittent gas venting from the AGI Not Significant	Airborne Particulate Matter / Dust emissions Minor Significance (or less)
Gas Connection Route Corridor Two	Airborne Particulate Matter / Dust emissions Minor Significance (or less)	Intermittent gas venting from the AGI Not Significant	Airborne Particulate Matter / Dust emissions Minor Significance (or less)
Electrical Connection Compound Option One and Electrical Connection Corridor Option One	Airborne Particulate Matter / Dust emissions Minor Significance (or less)	N/A	Airborne Particulate Matter / Dust emissions Minor Significance (or less)
Electrical Connection Compound Option Two and Electrical Connection Corridor Option Two	Airborne Particulate Matter / Dust emissions Minor Significance (or less)	N/A	Airborne Particulate Matter / Dust emissions Minor Significance (or less)

6.11 Next Steps

6.11.1 Based on the above assessment methodology, significance criteria, and the initial modelling results presented in Section 5.5, a full air quality impact assessment will be undertaken to determine the likely

environmental impacts of operation of the Project, both in isolation and in conjunction with other significant emissions sources identified through consultation with the relevant authorities.

6.11.2 The dispersion modelling will consider a study area of up to 20 km by 20 km centred upon the central point of the proposed stacks (i.e. 10 km radius) and will also model all potentially sensitive receptors (ecologically designated sites, etc.) discretely in order to accurately determine the maximum, worst case impact to air quality due to operation of the Power Generation Plant. The receptors to be considered will be supplemented, as appropriate, with any additional receptors highlighted through the consultation process.

6.11.3 When considering the impacts on ecologically sensitive sites within the study area an assessment will also be made of the process contributions to nutrient and acid deposition which have the potential to degrade the quality of an ecological site.

6.11.4 The impact of road traffic generated throughout all scenarios for the development of the proposed Project will be assessed using the methodology prescribed in the Department for Transport “Design Manual for Roads and Bridges” for the estimation of emissions from vehicles.

6.11.5 The information presented in this section will be supplemented to allow for preparation and finalisation of the ES.

SECTION 7

NOISE AND VIBRATION

7 NOISE AND VIBRATION

7.1 Introduction

7.1.1 The construction, operation and decommissioning of the proposed Project all have the potential to impact on local ambient noise levels and have the potential to generate vibration which may impact on sensitive receptors. All phases of the proposed Project and their potential impacts from noise and vibration will therefore be assessed within the EIA.

7.1.2 This Section presents the preliminary noise and vibration assessment for the proposed Project and includes:

- The existing baseline conditions against which the assessment is being made;
- The assessment methodology proposed for the EIA including the identification of specific sensitive receptors;
- Significance criteria;
- The potential impacts of the proposed Project; and
- Proposals for the mitigation of any anticipated significant environmental impacts, as appropriate.

7.2 Legislative and Policy Context

National Policy Statements

7.2.2 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic noise and vibration impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

7.2.3 NPS EN-1 sets out the requirements for a noise assessment of an energy NSIP and also outlines the approach that the Secretary of State should adopt when considering noise assessments. Paragraph 5.11.9 requires the SoS to be satisfied that the proposals will:

- Avoid significant adverse impacts on health and quality of life from noise;

- Mitigate and minimise other adverse impacts on health and quality of life from noise; and
- Where possible, contribute to improvements to health and quality of life through the effective management and control of noise.

7.2.4 NPS EN-2 sets out assessment principles in respect of fossil fuel energy generation NSIPs. It states that the SoS must be satisfied that the principles set out at paragraph 5.11.9 of NPS EN-1 have been satisfied and notes that mitigation for noise for such proposals is likely to be primarily through good design (i.e. enclosures, exhaust attenuation to turbines) and refers to the use of requirements attached to the DCO to secure relevant mitigation.

Other National and Local Policy

7.2.5 Whilst the PA 2008 is clear as to the primacy of the relevant NPS, other national and local planning policy can be considered important and relevant by the Secretary of State in the determination of an energy NSIP.

7.2.6 The DEFRA Noise Policy Statement for England (2010) sets as it aims the above three points. It also notes in the explanatory notes: “In reality, although it has not always been stated, the aim has tended to be to minimise noise, as far as reasonably practical”

7.2.7 The NPPF (DCLG, 2012) states that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

7.2.8 In order to deliver sustainable development, the NPPF states “to help economic growth, local planning authorities should plan proactively to meet the development needs of business and support an economy fit for the 21st century”.

Standards and Guidance

7.2.9 BS 7445 'Description and Measurement of Environmental Noise' defines and prescribes best practice during recording and reporting of environmental noise. This standard should be applied in all instances when making environmental noise measurements.

7.2.10 BS 4142 ‘Method for rating industrial noise affecting mixed residential and industrial areas' offers guidance on the assessment of industrial and commercial noise affecting residential and industrial areas. It describes a method for assessing whether industrial noise is likely to result in complaints from nearby residents.

7.2.11 EA Horizontal Guidance H3 Part 2: Noise assessment and control. This document provides the principles of noise measurement and prediction and control of noise by design, by operational management techniques and abatement technologies. Horizontal guidance provides information relevant to all sectors regulated under the environmental permitting regulations (EPR).

7.2.12 World Health Organisation (WHO) Guidelines for Community Noise - This document provides advice and guideline values for noise in specific environments.

7.2.13 BS 5228 'Noise and vibration control on construction and open sites' gives recommendations for basic methods of noise and vibration control relating to construction sites and other open sites where construction activities are carried out. It offers a methodology for predicting noise levels from construction sites and assessing its impact on those exposed to it. BS5228 is the industry approved code of practise and should be used in all cases when assessing noise from construction sites.

7.2.14 BS 6472 (2008) ‘Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hertz (Hz) to 80 Hz)’ presents recommended frequency weighted vibration spectra (for continuous vibration) and Vibration Dose Values (VDV) (for intermittent vibration), above which adverse comment is likely to occur in residential properties.

7.2.15 BS 7385 (1993) ‘Evaluation and Measurement for Vibration in Buildings’ presents guide values or limits for transient vibration, above which there is a likelihood of cosmetic damage.

7.3 Project Scenario for Assessment

7.3.1 In respect of noise and vibration, the realistic worst case scenario from the proposed Project parameters (which are described in Section 3 of the PEIR) is set out in Table 7.1 below.

7.3.2 The reason the parameters, identified in Table 7.1, represent the realistic worst case in relation to noise and vibration impacts are that, an increasing number of separate SCGT units, each with their own dedicated stack, will produce increasingly more noise. Noise from the GT turbine assembly is attenuated by the turbine casing, and so varies little between low and higher power output turbines. The main variable noise producing element is exhaust noise through the top of the stack. The stack sound power level for a typical c60MW SCGT unit is 110dB(A), compared to a single 100MW unit, which can have a typical sound power level of 113dB(A) through the stack. Therefore, the noise output from five separate low power SCGT units will be higher than that produced by one or two high power units. Similarly, the construction of five separate SCGT units will result in a longer construction lead time, which will increase the noise impact at sensitive receptors. This applies regardless of whether we are assessing aero-derivative or industrial units.

Table 7.1 - Realistic Worst Case Scenario for Assessment of Noise Impacts

Parameters	Details
Number of gas turbine units	5 (~ 59 MWe)
Number of stacks	5
Height of Stacks	30 m
Unit type	Aero derivative

7.3.3 The computer noise modelling software CadnaA (Version 4.1), which uses the ISO 9613 propagation algorithms has been used to undertake a provisional noise calculation. The model estimates the contribution to noise levels at each NSR location, and has been created using representative sound power level information for typical plant items.

7.3.4 The model is intended to provide a preliminary assessment only for the operational phase of the Power Generation Plant. A noise contour plot to show the predicted spread of noise from the proposed Project in 5 dB bands is included in Figure 7.1 for reference. The detailed operational noise modelling will be undertaken as part of the EIA, when full details of all plant items will be available.

7.3.5 All imbedded mitigation included in the noise model is identified in the Design Mitigation section.

7.3.6 Both Gas Connection route corridor options and both Electrical Connection Compound options and Electrical Connection route corridor options are considered in this preliminary assessment.

7.4 Assessment Methodology and Significance Criteria

Methodology

7.4.2 The following noise and vibration impact assessment focuses on six noise sensitive receptor (NSR) locations, which are identified in Section 7.7 and on Figure 7.1.

7.4.3 The existing baseline conditions at each location have been determined by way of an attended noise survey. Discussions were held with MSDC, SCC and the EA to agree a study area, a noise survey methodology, and suitable locations for the NSR measurement positions.

7.4.4 A prediction of the impact during construction is undertaken following the methodology of BS 5228, and information regarding the noise output of specific items of plant contained therein.

7.4.5 The noise impacts during operation are predicted using CadnaA noise propagation modelling software, using typical values for the proposed plant items, and considering directional and screening effects.

7.4.6 The significance of the predicted operational impact is assessed against the semantics of BS 4142. The significance criteria for the construction phase are discussed in Section 6.4.

Significance Criteria

7.4.7 The following sections provide the assessment methodology and significance criteria associated with noise and vibration from the construction, operation and decommissioning phases of the proposed Project.

Construction / Decommissioning

7.4.8 The noise impacts of decommissioning will be similar to those that will be assessed for construction. The assessment will therefore be carried out on the same basis as that for those arising from construction activities.

7.4.9 Table 7.2 sets out the construction noise significance threshold taken from BS 5228:2009 for day, night, evening, and weekend periods.

Table 7.2 - Construction Noise Significance Threshold

Period	Period Classification	Threshold Level (L_{Aeq},T)
Night-time	23:00 – 07:00	45
Evening & Weekends	Weekdays 19:00 – 23:00 Saturdays 13:00 – 23:00 Sundays 07:00 – 23:00	55
Daytime	Weekdays 07:00 – 19:00 Saturdays 07:00 – 13:00	65

7.4.10 The levels are façade value LAeqs (and include noise from other sources). There are various indices for expressing the noise levels produced by working sites. However, the LAeq index is regarded as standard and has been used in this assessment. LAeq is the equivalent continuous sound level expressed in “A weighted” decibel terms and is, in general, used as a description of environmental noise. It represents the steady sound level, which would produce the same energy as a fluctuating sound, over the same period of time.

7.4.11 Vibration from construction activities may impact on adjacent buildings. The criteria used in this assessment relate to the potential for cosmetic damage, not structural damage. The principal concern is generally transient vibration due to impact piling. Cosmetic damage is most likely to occur within the first 20 m of piling activities; damage is less likely to occur at greater distance. Likely levels of vibration at given distances can be predicted from existing piling vibration data.

7.4.12 BS7385 establishes the basic principles for carrying out vibration measurements and processing the data with regard to evaluating vibration impacts on buildings. Table 7.3 provides recommended peak particle velocity (PPV) vibration limits for transient excitation for different types of buildings (as set out in BS7385: Part 2, 1993).

Table 7.3 - Peak Particle Velocity (ppv) Limits for Cosmetic Damage[1]

Type of Building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	
Un-reinforced or light framed structures. Residential or light commercial type buildings[2]	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

1 Values referred to are at the base of the building.

2 At frequencies below 4 Hz a maximum displacement of 0.6 mm (zero to peak) should not be exceeded.

7.4.13 Significance criteria for construction noise and vibration have been derived from BS 5228 and BS 7385. An adapted scale for the description of the significance of construction noise is shown in Table 7.4.

Table 7.4 - Significance of Construction and Decommissioning Noise

Impact Category	Description	Significance Criteria
Negligible	Daytime noise levels < ambient L_{Aeq} Vibration levels < 0.15 mm/s	Not significant
Minor	Daytime noise levels > ambient L_{Aeq} but < 65 dB L_{Aeq}. Vibration levels > 0.15 mm/s, but < 1 mm/s.	Not Significant
Moderate	Daytime noise levels > 65 dB L_{Aeq} but < 70 dB L_{Aeq}. Vibration levels > 1 mm/s but < 3 mm/s.	Significant
Major	Daytime noise levels > 70 dB L_{Aeq} but < 75 dB L_{Aeq} Vibration levels > 3mm/s but < 5 mm/s.	Significant
Severe	Daytime noise levels > 75 dB L_{Aeq} Vibration levels > 5 mm/s.	Significant

Operation

7.4.14 BS 4142 provides a methodology for the assessment of industrial noise in mixed residential and industrial areas. In this case, the standard suggests obtaining an assessment level by comparing the existing background noise levels with the 'rating level', which is the predicted noise output of the Power Generation Plant, corrected to account for any acoustic features such as tonal or impulsive noises. The semantics used for assessing the likelihood of complaints due to the introduction of a new industrial noise source are as follows:

- When subtracting the background level from the rating level, the greater the difference, the greater the likelihood of complaints.
- A difference of around +10 dB or more indicates that complaints are likely.
- A difference of around +5 dB is of marginal significance.
- If the rating level is more than 10 dB below the measured background noise level then this is a positive indication that complaints are unlikely.

7.4.15 Therefore the significance criteria presented in Table 7.5 has been adopted for the purposes of the assessment of operational noise from the Power Generation Plant.

Table 7.5 - Significance of Operational Noise

Impact Category	Description	Significance Criteria
Negligible	Noise rating level 10 dB below the existing background noise. Vibration levels greater than 0.15 mm/s, but less than 1 mm/s at 4 Hz or above.	Not Significant
Minor Adverse	Noise rating level not more than 5 dB (A) above existing background noise (BS 4142 “marginal significance” criteria). Vibration levels greater than 1 mm/s, but less than 3 mm/s at 4 Hz or above.	Not Significant
Moderate Adverse	Noise rating level between 5 and 10 dB (A) above existing background noise. Vibration levels greater than 3 mm/s, but less than 5 mm/s at 4 Hz or above.	Significant
Major Adverse	Noise rating level more than 10 dB above the existing background noise. Vibration levels greater than 5 mm/s at 4 Hz or above.	Significant

7.5 Embedded Design Mitigation

7.5.1 The proposed Project has been designed from the outset to ensure its impacts are minimised. This includes mitigation that is embedded into the design of the Power Generation Plant, Gas Connection and Electrical Connection and industry standard methods and procedures to ensure impacts from construction, operation and decommissioning are minimised. In respect of noise and vibration this mitigation includes:

- The GT(s), and major compressors are to be housed in individual acoustic enclosures, of heavy construction, specified at 85 dB (A) Sound Pressure Level at 1 m.

- Turbine filter and ventilation apertures are to be fitted with high performance silencers, and designed such that all sensitive receptors benefit from screening and/or directivity corrections.

- High performance silencers will be installed in the outlet duct(s) between the GT(s). Due to the impracticality of screening stack noise, discharge noise will be controlled using these silencers that will be tuned to attenuate low frequencies from the GT exhausts.

- Unit transformers and generator transformers will be housed in an appropriate enclosure or three sided pen, to provide full screening to NSRs.

7.5.2 The assessment in this Section takes such design mitigation into account. Any additional mitigation developed in response to specific impacts identified in this assessment is described in paragraph 7.9 below.

7.6 Consultation

7.6.1 Table 7.6 below provides a list of consultation responses relating to noise and vibration and illustrates how each response has been addressed.

Table 7.6 - Scoping Consultation Responses

Reference	Comment	Actions
PLANNING INSPECTORATE		
3.7	The SoS notes the comments regarding the assessment of noise during operation for the gas and the electricity connections. Based on the assumption that the connections will be below ground, the SoS agrees to this. However, this is subject to the connections being below ground, the noise of substations and all above ground installations will require assessment within the ES.	Assessment of noise and vibration from all above ground installations (AGI's), including the substation will be included in the ES.
3.24	The SoS recommends that the methodology and choice of noise receptors should be agreed with the relevant local authorities and with the Environment Agency (EA).	The ambient noise survey methodology was agreed with MSDC, SCC and the EA before any survey works were undertaken.
3.25	The noise and vibration assessments should take account of the increased traffic movements along access routes, especially during the construction phase. The results from the noise and vibration assessments will also provide information to inform the ecological assessments, exceptional but essential operations such as venting (as applicable to the technology) should be included in the assessment.	The ES will include the noise and vibration impact of increased road traffic for the construction, operation, and decommissioning phases. The ES will also include the assessment of noise from steam venting.
3.26	Noise impacts on sensitive receptors should be specifically addressed. Particularly effects on people from any potential noise disturbance at night and other unsocial hours such as weekends and public holidays.	Noise impacts from the proposed Project are being assessed at sensitive receptors for the construction, operational and

		decommissioning phases.
3.27	Where appropriate, effective measures should be provided to mitigate against noise nuisance. Negative effects of any proposed mitigation on other areas of assessment in the EIA should also be assessed – such as the implementation of sound screens on wildlife or on visual impact. The ES must make a clear distinction between the assessment of effects with and without mitigation.	Following the detailed assessment any noise and vibration mitigation measures, as required, will be identified in the ES.
3.28	Consideration should be given to monitoring noise complaints during construction and when the development is operational.	The option for continuous noise monitoring will be discussed in the ES
3.33 & 3.66	Cross reference air quality (including dust) with ecology, noise, vibration, water management, and traffic & Infrastructure.	The ES noise chapter will cross reference other disciplines where appropriate.
SUFFOLK COUNTY COUNCIL		
4	...more detail on implications of technology choice on operating requirements, such as water usage and noise is required.	Preliminary details of the choice of SCGT and operational regime have been provided in this PEIR and will be added to, where appropriate in the ES.
14	It will be important to recognise the linkages across the different topic areas, particularly when developing mitigation to ensure that initiatives being undertaken are complementary. Measures to minimise noise intrusion for example should also consider overlap with design and landscaping considerations.	The ES noise chapter will cross reference other disciplines where appropriate to do so.
16	Based on the Scoping Report, our main concerns are; that the impacts on health are properly assessed. It is not clear where this will be done in the ES. The assessment will need to reflect	The noise and vibration impacts from the proposed Project are being assessed at sensitive

	how impacts associated with air quality, noise, amenity and transport in particular affect the local population.	receptors for both the construction and operational phases.
64	The area is well served by such links (Public Rights of Way) and they are highly valued by local people. Consequently we would expect the ES to describe the local network, its extent (including the unofficial diversions and permissive paths) and usage. It should then evaluate the potential impact of the development on this network, both directly by construction activity and indirectly by diminishment of amenity value (due to for example visual or noise impacts of the development).	The noise and vibration impacts from the proposed Project is being assessed at sensitive receptors for both the construction and operational phases – sensitive receptors such as Public Rights of way will be included in the assessment.
76	As well as showing a contour map from the noise modelling, a list of the major noise sources (relating to the plant, electricity and gas infrastructure) should also be included in the ES to aid assessment.	A cumulative assessment will be completed as part of the ES, this will include noise from all major sources, gas and electricity infrastructure. A preliminary cumulative impact assessment is included in the PEIR.
77	The construction noise assessment should include reference to noise from construction vehicles accessing the site.	On site traffic is included as part of the construction assessment.
78	Furthermore, the occurrence of any “steam releases” from the GTs (if relevant) should also be described in the ES (this is described as a nuisance associated with existing plant on neighbouring land).	SCGT peaking plants do not need to release steam as part of their operation.
MID SUFFOLK DISTRICT COUNCIL		
p.2	The applicant’s attention is drawn to the comments made by SCC and in particular the provisions of the Suffolk Waste Core Strategy. The applicants will also be aware that the Eye Airfield Development Framework is close to adoption. This document	All monitoring locations were agreed with the local authority prior to undertaking the noise survey.

	makes provision for possible residential development within the vicinity of the proposed Power Generation Plant. It will therefore be necessary for the environmental impact assessment to take this factor into account, especially in relation to noise and air quality issues.	As part of the ES an operational noise contour plot will be produced to show the spread of noise from the plant. The noise contour plot will identify the predicted noise level in the areas identified for potential residential development, discussions can then be held as to the appropriateness of these locations with regard noise.
p.2	It should be noted that the site is located within a predominantly rural area where the ambient background noise levels are low, especially at night. The overall approach to the assessment of noise and vibration issues is acceptable however the Council would request that the applicant agrees the baseline line monitoring positions before commencing the background noise surveys. The Scoping Report suggests four locations for monitoring purposes but a fifth position on the outskirts of Eye should be considered near to the residential properties in Castleton Way.	The ambient noise survey methodology was agreed with the MSD, SCC and the EA before any survey works were undertaken.
NATURAL ENGLAND		
1	Schedule 4 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended), sets out the necessary information to assess impacts on the natural environment to be included in an Environmental Statement, specifically: A description of the development, including in particular ..... an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc) resulting	The noise and vibration assessment will be completed in the ES using IEMA guidelines, all best practice methods and British Standards.

	from the operation of the proposed development.	
YAXLEY PARISH COUNCIL and THRANDESTON PARISH COUNCIL		
1	The area covered by assessments relating to Noise & Vibration should have a minimum radius of 2 kilometres.	Confirmed.
3	The noise monitoring position identified in the scoping report on Old Norwich Road, Yaxley is inappropriate because it lies behind a high earth bund that screens sound from the east. A position at a property further south along the road towards the centre of the village would be more representative.	The operational noise model for the proposed Project l includes all topographical information, corrections being made for any screening bodies, earth bunds etc.
BROME and OAKLEY PARISH COUNCIL		
28 May 2013 - 3	Information regarding the likelihood and subsequent measures to be taken to prevent any noise pollution issues to the local community, and what levels of noise are likely to occur if any.	All information regarding the noise and vibration impacts for both the construction and operational phases will be identified in the ES.
11 June 2013 – p.1	additional noise and visual impact measuring point (Power Generation Plant) as per the drawings attached on pages 2 and 3.	All monitoring locations were agreed with MSDC, SCC and the EA prior to undertaking the noise survey. In addition, a further monitoring locations (No.3) was added following the request from Brome and Oakley Parish Council.
EYE TOWN COUNCIL		
p.1	Noise Monitoring sites; add Langton Green/Grove to the East and the high ground to the South West beyond Cranley Manor in the area Fuffolk Farm and Cranley Green. There is already a high level of noise over this area caused by the regular venting of steam from the existing power station so any extra noise could be	Following discussions with MSDC, and following this comment an additional location was included to cover these locations.

	a problem.	

7.7 Baseline Conditions and Receptors

7.7.1 The Power Generation Plant Site comprises land on the former Eye Airfield. The surrounding area is mainly open agricultural land with scattered residential dwellings. The small town of Eye approximately 1 km to the south east of the site, and the village of Yaxley 800 m to the south west. The baseline noise climate in the area is largely dominated by road traffic during the daytime. During the night time when road traffic levels reduce a continuous low level noise is audible from the existing power plant.

7.7.2 The Electrical Connection route is proposed to run east over open agricultural land for a distance of approximately 1.2km to the existing overhead power cables north east of the village of Yaxley. It is proposed to construct an electrical connection compound at this location. The surrounding area is mainly open agricultural land with scattered residential dwellings and the village of Yaxley to the south at a distance of approximately 500m.

7.7.3 Options for the Gas Connection routes are proposed to either run east and terminate at the existing Chicken Litter Power Plant, or south for a distance of approximately 800m and terminate adjacent to Castleton Way 500m to the east of the village of Yaxley.

Baseline Noise Survey

Monitoring Positions

7.7.4 Discussions were held with MSDC, SCC and the EA to agree a study area, a noise survey methodology, and suitable locations for the NSR measurement positions.

7.7.5 An attended noise survey was then undertaken to determine the spread of noise in the area, a number of attended short term sampling measurements were taken at pre-determined NSR's within the agreed study area. The baseline noise survey was completed over a period of 24 hours.

Table 7.7 - NSR Measurement Positions

Location	Location Number
Haygate	1
Hammond Farm, Old Norwich Road	2
Goswold Hall	3
Junction nr The Maltings	4
Four Oaks Park	5
Mullberrybush Nursery	6

7.7.6 The locations of the NSRs, in relation to the Power Generation Plant site are presented in Figure 7.1

7.7.7 Baseline noise measurements were taken at each of the NSR's between 21st and 22nd July 2013. Weather conditions were conducive to successful monitoring with wind speeds less than 5 m/s. Roads were dry, and there was no precipitation at the time of measurement. The measurement microphones were positioned in free field at 1.4 m above ground level and well away from any vertical reflective facades. A wind-shield was used to minimise the effects of wind noise. The ambient temperature was between 16°C and 29°C during the monitoring period.

7.7.8 Each measurement recorded the same five statistical parameters (L90, Leq, Lmax, L10, Lmin.) in unweighted third octave bands, with the overall figure reported using the A-weighed frequency network.

7.7.9 All monitoring was conducted using Class 1 Sound Level Meters. A field calibrator was used to calibrate and check the meter before and after the measurement period with no change in level recorded. Specific details of the equipment used, including serial numbers and calibration dates is available on request.

7.7.10 To provide a worst case background noise level to assess against the lowest LA90 from either the daytime or night time measurements at each NSR have been used.

7.7.11 The full results of the baseline noise measurements are available on request. Table 7.8 summarises the lowest LA90 measured at each NSR position during the baseline noise survey.

Table 7.8 - Summary of Lowest Recorded LA90 at each Measurement Position

Measurement Position	Lowest Measured LA90, dB
Haygate	28
Hammond Farm, Old Norwich Road	31
Goswold Hall	30
Junction nr The Maltings	27
Four Oaks Park	32
Mullberrybush Nursery	30

7.7.12 There are a number of heavy industrial facilities in the area surrounding the Project Site, including the existing Eye Chicken Litter Power Plant, and the National Grid Gas Compressor Station. To ensure that creeping background noise levels do not occur, the EIA will include a cumulative noise assessment. This assessment will be cross checked against the historical background noise levels measured as part of the Environmental Permit application for the Chicken Litter Power Plant, undertaken in 2007.

7.8 Preliminary Assessment of Potential Impacts

POWER GENERATION PLANT

Construction

7.8.2 Construction activity inevitably leads to some degree of noise disturbance at locations in close proximity to the construction activities. It is however a temporary source of noise. The noise levels generated by construction activities would have the potential to impact upon nearby noise sensitive receptors. Noise levels at any one location will vary as different combinations of plant machinery are used and throughout the construction of the proposed Project as the construction activities and locations change.

7.8.3 The likely construction noise levels have been predicted using the methodology set out in BS 5228 in conjunction with general information regarding proposed activities.

7.8.4 The construction noise assessment procedure, as set out in BS5228 is described below:

Stage 1. Obtain an activity LAeq by direct measurement of similar plant in the same mode of operation, or use the indicative plant noise sound pressure values provided in Annexes C and D of BS 5228, these values have been measured at a distance of 10m.

Stage 2. If the distance R, in metres (m) from the point of interest to the geometric centre of the plant or activity is other than 10m subtract from the LAeq obtained in stage 1 using the following equation:

$$L_2 = L_1 - 20Log_{10}\frac{R}{10}$$

Where:

L1 = Measured plant noise level at 10m distance

L2 = Predicted plant noise level at assessment location (NSR)

R = Distance between geometrical centre of noise source and assessment location (NSR)

7.8.5 The equation identified in stage 2 of the BS5228 construction noise assessment method has been used to calculate each separate identified plant noise source. This method predicts the total potential sound pressure level at each NSR as a result of construction activities. Each plant noise source has been calculated as being the shortest distance between the site boundary and each NSR.

7.8.6 Table 7.9 presents the noise levels associated with typical construction activities, and predicts the likely noise level contributed by each item of plant at each NSR. The estimated sound pressure levels shown are worst-case estimates based on distance attenuation only.

Distance Attenuation - Discussion

7.8.7 Distance attenuation is the term used to describe the reduction of sound energy in a sound wave as it travels through a medium. When a sound wave travels through air its intensity diminishes due to air pressure (absorption) and scattering. Absorption is the conversion of the sound energy to other forms of energy. Scattering is the reflection of the sound in directions other than its original direction of propagation. The combined effect of absorption and scattering over distance is referred to as distance attenuation.

7.8.8 To address the changing nature of construction noise sources, such as different plant items being used at different times, a detailed construction program is needed to identify each construction phase. In the absence of a detailed construction program this assessment has

been based upon all identified plant items being used simultaneously. It is noted that in reality this scenario is extremely unlikely to occur and hence predicted noise levels are considered worst case. A more detailed construction programme will be available by the time of the submission of the full ES.

Table 7.9 - Sound Pressure Levels of Typical Construction Activities

Construction Activity / Associated Plant	Calculated Sound Pressure Level						
	10m from plant	NSR 1	NSR 2	NSR 3	NSR 4	NSR 5	NSR 6
Site Preparation							
Dozer	75	33.4	35.0	35.6	33.4	35.5	34.2
Tracked Excavator	78	36.4	38.0	38.6	36.4	38.5	37.2
Tracked Concrete Crusher	84	42.4	44.0	44.6	42.4	44.5	43.2
Wheeled Backhoe Loader	68	26.4	28.0	28.6	26.4	28.5	27.2
Total	-	43.9	45.5	46.1	43.9	46.0	44.6

Excavation	10m from plant	NSR 1	NSR 2	NSR 3	NSR 4	NSR 5	NSR 6
Dozer	81.0	39.4	41.0	41.6	39.4	41.5	40.2
Tracked Excavator	79.0	37.4	39.0	39.6	37.4	39.5	38.2
Loading Lorry	80.0	38.4	40.0	40.6	38.4	40.5	39.2
Articulated Dump Truck	81.0	39.4	41.0	41.6	39.4	41.5	40.2
Total	-	44.8	46.3	47.0	44.8	46.9	45.5

Rolling and Compaction	10m from plant	NSR 1	NSR 2	NSR 3	NSR 4	NSR 5	NSR 6
Roller	79.0	37.4	39.0	39.6	37.4	39.5	38.2
Vibratory Plate	80.0	38.4	40.0	40.6	38.4	40.5	39.2

Total	-	41.0	42.5	43.2	41.0	43.1	41.7
Piling	10m from plant	NSR 1	NSR 2	NSR 3	NSR 4	NSR 5	NSR 6
Hydraulic Hammer Rig	89.0	47.4	49.0	49.6	47.4	49.5	48.2
Rotary Bored Piling Rig	83.0	41.4	43.0	43.6	41.4	43.5	42.2
Total	**-**	48.4	50.0	50.6	48.4	50.5	49.1
Welding/Cutting Steel	10m from plant	NSR 1	NSR 2	NSR 3	NSR 4	NSR 5	NSR 6
Welder (Welding Piles)	73.0	31.4	33.0	33.6	31.4	33.5	32.2
Generator for welder	57.0	15.4	17.0	17.6	15.4	17.5	16.2
Cutter (Cutting Piles)	68.0	26.4	28.0	28.6	26.4	28.5	27.2
Total	-	32.7	34.3	34.9	32.7	34.8	33.4
Other	10m from plant	NSR 1	NSR 2	NSR 3	NSR 4	NSR 5	NSR 6
Lorry Concrete Mixer	77.0	35.4	37.0	37.6	35.4	37.5	36.2
Conc. Pump (Discharging)	67.0	25.4	27.0	27.6	25.4	27.5	26.2
Tower Crane	77.0	35.4	37.0	37.6	35.4	37.5	36.2
Total	-	38.6	40.2	40.9	38.6	40.8	39.4

7.8.9 Table 7.10 provides a preliminary noise prediction for the construction phase of the proposed Project. The predicted cumulative construction level is below the daytime limit of 65 dB (A), and the evening and weekend limit of 55 dB (A) at all receptors. Therefore, based on this

very conservative assessment, the significance of the overall impact of construction noise is predicted to be minor at all NSR locations.

Table 7.10- Preliminary Construction Noise Projection

Total Calculated Sound Pressure Level from All Construction Activities, dB(A)						
Receptor	NSR 1	NSR 2	NSR 3	NSR 4	NSR 5	NSR 6
Total	51.6	53.2	53.8	51.6	53.7	52.4

Operation

7.8.10 The computer noise modelling software CadnaA (Version 4.1), which uses the ISO 9613 propagation algorithms has been used to undertake a provisional noise calculation. The model estimates the contribution to noise levels at each NSR location, and has been created using a representative sound power level for the whole plant.

7.8.11 The model is intended to provide an indicative assessment only for the operational phase of the Power Generation Plant. The detailed operational noise modelling will be undertaken as part of the EIA, when full details of all plant items will be available.

7.8.12 As part of the detailed modelling to follow in the full EIA, a number of assumptions with regards to the noise control will be included on major plant items, these are stated below.

7.8.13 All plant items shall be controlled to minimise noise of an impulsive or tonal nature, such that the rating level as defined in BS 4142 is equal to the specific noise level.

7.8.14 The model considers normal operational noise. As such, noise due to non-normal operation plant items have not been considered.

7.8.15 Table 7.11 presents a summary of the predicted noise levels, from the Power Generation Plant, at each of the NSR locations. The measured background noise levels (LA90) are also shown and compared to the BS 4142 rating level.

7.8.16 As part of the operational noise assessment any noise sources that are considered to contain acoustic features, such as being tonal, impulsive or intermittent in nature should carry a 5 point penalty. If considered appropriate the 5 point penalty is added to the predicted plant noise LAeq to give the ‘rating level’, (as defined is BS 4142). All plant and equipment items shall be controlled to minimise noise of an impulsive or tonal nature. However, the Power Generation Plant is intended to be

used as a Peaking Plant therefore the operation will be inherently intermittent; as such the 5 point penalty has been duly applied.

Table 7.11 - BS 4142 Assessment Summary

NSR Location	1	2	3	4	5	6
Predicted Plant Noise Level, L_{Aeq}	28.7	30.4	31.6	29.5	31.2	29.7
Rating Penalty, dB	5	5	5	5	5	5
Rating Level, dB(A)	33.7	35.4	36.6	34.5	36.2	34.7
Lowest Night Background Level, L_{A90}	28	31	30	27	32	30
Difference	5.7	4.4	6.6	7.5	4.2	4.7

7.8.17 Figure 7.1 includes a noise contour that shows the predicted spread of noise levels surrounding the proposed Power Generation Plant. It is noted these results should be considered as preliminary only, and are subject to change during the detailed acoustic modelling for the EIA. However, it is considered that any change will not be significant.

7.8.18 Table 7.11 shows that at all locations the rating level is above the lowest measured background noise level. Based on this preliminary assessment the impact of operational noise from the proposed Project is considered to be minor adverse at NSR locations 2, 5 and 6, and moderate adverse at NSR locations 1, 3 and 4.

Operational Vibration

7.8.19 It is predicted that on site vibration sources will include the following:

- Balanced rotating equipment, such as turbines;
- Wind induced vibrations in the stacks to be transmitted to the foundations.

7.8.20 With the distances involved between Power Generation Plant site and the NSRs, it is anticipated that the level of induced vibration will be imperceptible at the nearest sensitive receptor. Operational vibration impacts are thus not assessed further.

GAS CONNECTION ROUTE CORRIDOR OPTION 1

7.8.21 The construction and operation of the Gas Connection route corridor option 1 has the potential to create a noise and vibration impact at NSR locations.

Construction

7.8.22 During the construction phase the following activities are likely to be included:

- Ground works
- Laying of pipes

7.8.23 Surface plant such as cranes, excavators, compressors and generators are not recognised as sources of high levels of vibration. Even at a close distance of 10m, Peak Particle Velocity (PPV) levels significantly less than 5mms^{-1} are generated by such plant. For example, a bulldozer would generate a PPV of approximately 0.6mms^{-1} and a 'heavy lorry on poor road surface' would generate a PPV of less than 0.1mms^{-1}. These values are well below limits at which cosmetic building damage becomes likely (15mms^{-1}) as identified in BS7385: Part 2, 1993. It follows that the vibration impact at sensitive receptors from the identified construction activities for the Gas Connection route corridor options 1 and 2 is predicted to be not significant.

7.8.24 The noise impact at sensitive receptors from the identified construction activities is anticipated to be minor adverse. It is noted that the nature of construction activities is temporary, and as such any noise impact related to construction will be limited by the short term duration.

Operation

7.8.25 During the operation of this Gas Connection, the following elements have the potential to generate noise:

- Gas venting – pressure valves

7.8.26 Gas venting has the potential to create moderate annoyance at NSR's. Detailed noise mitigation will be required to control the noise from pressure release valves.

Decommissioning

7.8.27 At this stage it is envisaged that upon decommissioning of the Power Generation Plant, the Gas Connection would remain in-situ, as

removing the pipe would likely be more environmentally damaging. As such, it is anticipated that there would be no noise impacts during the decommissioning of this Gas Route.

GAS CONNECTION ROUTE CORRIDOR OPTION 2

7.8.28 The construction and operation of the Gas Connection route corridor option 2 has the potential to create a noise and vibration impact at NSR locations.

Construction

7.8.29 During the construction phase the following activities are likely to be included:

- Ground works
- Laying of pipes

7.8.30 The vibration impact at sensitive receptors from the identified construction activities is predicted to be not significant.

7.8.31 The noise impact at sensitive receptors from the identified construction activities is anticipated to be moderate adverse. It is noted that the nature of construction activities is temporary, and as such any noise impact related to construction will be limited by the short term duration.

Operation

7.8.32 During the operation of this, the following elements have the potential to generate noise:

- Gas venting – pressure valves

7.8.33 Gas venting has the potential to create moderate annoyance at NSR's. Detailed noise mitigation will be required to control the noise from pressure release valves.

Decommissioning

7.8.34 At this stage it is envisaged that upon decommissioning of the plant, the Gas Connection would remain in-situ, as removing the pipe would likely be more environmentally damaging. As such, it is anticipated that there would be no noise impacts during the decommissioning of this Gas Route.

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 1

7.8.35 An Electrical Connection Compound, comprising a new substation and sealing end compound will be constructed to transfer power from the power plant onto the grid.

7.8.36 The construction and operation of the Electrical Connection and the Electrical Connection Compound option 1 has the potential to create a noise and vibration impact at NSR locations.

Construction

7.8.37 During the construction phase the following activities are likely to be included:

- Ground works
- Laying of pipes and cables
- Construction of the substation
- Construction of the SEC

7.8.38 The vibration impact at sensitive receptors from identified construction activities is predicted to be not significant.

7.8.39 The noise impact at sensitive receptors from the identified construction activities is anticipated to be moderate adverse. It is noted that the nature of construction activities is temporary, and as such any noise impact related to construction will be limited by the short term duration.

Operation

7.8.40 During the operation of the Electrical Connection and the Electrical Connection Compound, the following elements of the Electrical Connection Compound have the potential to generate noise:

- Main Electricity Hum
- Substation – Mechanical Cooling – Fan Noise

7.8.41 The substation has the potential to create minor annoyance at NSR's. Detailed noise mitigation will be required to control the noise from the substation cooling systems.

Decommissioning

7.8.42 For decommissioning, it is reasonable to assume the same plant items will be used to demolish the substation and sealing end compound.

Therefore, the vibration impact at sensitive receptors from decommissioning activities is predicted to be not significant.

7.8.43 The noise impact at sensitive receptors from decommissioning activities is anticipated to be moderate adverse.

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 2

7.8.44 The construction and operation of the Electrical Connection option 2 has the potential to create a noise and vibration impact at NSR locations.

Construction

7.8.45 During the construction phase the following activities are likely to be included:

- Ground works
- Laying of pipes and cables
- Construction of the Substation
- Construction of the Sealing End Compound

7.8.46 The vibration impact at sensitive receptors from identified construction activities is predicted to be not significant.

7.8.47 The noise impact at sensitive receptors from the identified construction activities is anticipated to be moderate adverse.

Operation

7.8.48 During the operation of the Electrical Connection, the following elements have the potential to generate noise:

- Main Electricity Hum
- Substation – Mechanical Cooling – Fan Noise

7.8.49 The substation has the potential to create minor annoyance at NSR's. Detailed noise mitigation will be required to control the noise from the substation cooling systems.

Decommissioning

7.8.50 For decommissioning it is reasonable to assume the same plant items will be used to demolish the substation and sealing end compound. Over the distances involved between any decommissioning activities

and sensitive receptors the vibration impact is predicted to be not significant.

7.8.51 The noise impact at sensitive receptors from decommissioning activities is anticipated to be moderate adverse.

7.9 Potential Mitigation / Management Techniques

Construction

7.9.2 In order to keep noise impacts from the construction phase to a minimum, all construction activities relating to the Power Generation Plant, Gas Connection, Electrical Connection and Electrical Connection Compound would be carried out in accordance with the recommendations of BS 5228. In addition, PPL will require its appointed contractor(s) to minimise the impact of construction activities through successful implementation of an agreed CEMP and proper communication with local residents.

7.9.3 Core site working hours will be agreed with MSDC and SCC and are specific to the construction site. For power station construction sites, these are generally Monday to Saturday between the hours of 0700 – 1900. Should it be necessary to work outside these core hours for certain activities, this would be with the prior written agreement of MSDC.

7.9.4 Specific method statements and risk assessments would be required for work undertaken during day, evening and night time hours. In order to minimise the likelihood of noise complaints in such eventualities, the contractor would be required to inform and agree the works in advance with MSDC whilst advising potentially affected residents of the works to be carried out outside normal hours. Furthermore, the residents would be provided with a point of contact for any queries or complaints.

7.9.5 All vehicles and mechanical plant used for construction would be fitted with effective exhaust silencers, and regularly maintained.

7.9.6 Inherently quiet plant would be used where appropriate. All major compressors would be sound-reduced models fitted with properly lined and sealed acoustic covers which would be kept closed whenever the machines are in use and all ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers.

7.9.7 All ancillary plant such as generators, compressors and pumps would be positioned so as to cause minimum noise disturbance. If necessary, temporary acoustic barriers or enclosures would be provided.

Operation

7.9.8 Noise limits will be agreed with MSDC and the following measures would serve to monitor and minimise the impact of noise from the proposed Project.

- A computer-based model of the proposed plant items will be produced at the EIA stage, to calculate the predicted noise levels at the NSR locations, and ensure that planning limits are adhered to. Detailed design will ensure that site noise is mitigated as far as possible, through site layout and consideration of the orientation of plant items associated with higher sound power levels.
- Since tonal or impulsive noises are considered more annoying than continuous noise sources, plant items will be silenced or otherwise controlled through regular maintenance.
- A programme of noise monitoring, including a noise survey shortly following the commissioning of the new plant, shall be agreed with MSDC and implemented at regular intervals. The aim of these surveys shall be to ensure that plant noise levels as measured at the agreed NSR locations do not exceed the planning noise limits; noise monitoring shall be undertaken in accordance with BS 4142.
- Inherently quiet plant items will be selected wherever practicable. In addition to the noise control measures mentioned above high performance silencers will be fitted to achieve maximum noise attenuation on plant including GT inlets and ductwork. Acoustic lagging and low noise trims will be fitted in necessary to all pipe-work and noise generating valves.
- High performance acoustic enclosures will be considered for all plant items where practicable, not overlooking smaller plant items such as compressors and pumps.
- Internal surfaces within plant buildings, if the choice of technology requires them, will be treated to control internal reverberant noise levels. An appropriate treatment would consist of dense mineral wool panel behind perforated sheet steel, or possibly a spray-on cellulose fibre treatment.
- When non-normal and emergency operations lead to noise levels in excess of the agreed planning limits, the operator will inform the local authority and residents of the reasons for these operations, and the anticipated emergency period.

7.9.9 During decommissioning, similar mitigation measures to those described above for construction will be implemented.

7.10 Preliminary Assessment of Residual Effects

On the basis of the preliminary environmental information and assessment described above, taking into account potential mitigation measures, likely significant noise and vibration effects as a result of the proposed Project are summarised in Table 7.12.

Table 7.12 - Noise and Vibration Assessment Summary

Project Element	Construction		Operation		Decommissioning	
	Noise	Vibration	Noise	Vibration	Noise	Vibration
Power Generation Plant	Minor Adverse - Not Significant	Negligible - Not Significant	Minor to Moderate Adverse – Significant	Negligible - Not Significant	Minor Adverse - Not Significant	Negligible - Not Significant
Gas Connection Route Corridor One	Minor Adverse – Not Significant	Negligible - Not Significant	Moderate Adverse - Significant	Negligible - Not Significant	Minor Adverse – Not Significant	Negligible – Not Significant
Gas Connection Route Corridor Two	Moderate Adverse - Significant	Negligible - Not Significant	Moderate Adverse - Significant	Negligible - Not Significant	Moderate Adverse - Significant	Negligible - Not Significant
Electrical Connection Compound Option One and Electrical Connection Corridor Option One	Moderate Adverse - Significant	Negligible - Not Significant	Minor Adverse – Not Significant	Negligible - Not Significant	Moderate Adverse - Significant	Negligible - Not Significant
Electrical Connection Compound Option Two and Electrical Connection Corridor Option Two	Moderate Adverse - Significant	Negligible - Not Significant	Minor Adverse – Not Significant	Negligible - Not Significant	Moderate Adverse - Significant	Negligible - Not Significant

7.11 Next Steps

7.11.1 During the full EIA the following steps will be completed:

Construction Phase

- Detailed construction noise and vibration assessment for substation
- Detailed construction noise and vibration assessment for Gas Connection
- Construction traffic noise impact assessment
- Assessment of residual impacts

Operational Phase

- Detailed computer noise model of all plant items using Cadna/A noise propagation modelling software for both power plant and substation
- Operational noise assessment to BS4142 using the results of the detailed model to include cumulative noise levels for both the power plant, substation and Gas Connection
- Operational traffic noise assessment
- Assessment of residual impacts.

SECTION 8

ECOLOGY

8 ECOLOGY

8.1 Introduction

8.1.1 The construction, operation and decommissioning phases of the proposed Project all have the potential to impact on the local ecology of the former Eye Airfield and its environs and have the potential to disturb various sensitive species. These potential impacts will therefore be assessed within the Environmental Impact Assessment (EIA).

8.1.2 This section summarises the findings of the further Phase 1 habitat surveys that have been undertaken since publication of the Progress Power Environmental Impact Assessment Scoping Report and provides up to date information relating to the species specific Phase 2 surveys that are ongoing.

8.1.3 The Phase 1 Habitat Surveys and Phase 2 Species Surveys have been carried out across an area that covers the Power Generation Plant, as well as the two Gas Connection options, the two Electrical Connection Compound options and the two Electrical Connection route options.

8.2 Legislative and Policy Context

8.2.1 Relevant wildlife and countryside legislation has been used along with planning policy guidance and local and national Biodiversity Action Plans (BAP) to inform this assessment. Their context and applicability is explained as appropriate in the relevant sections of this PEIR.

Legislation

8.2.2 The key legislation of relevance is:

- The Conservation of Habitats and Species Regulations 2010, as amended (Habitats Regulations);
- The Wildlife and Countryside Act 1981, as amended (WCA);
- The Countryside and Rights of Way (CRoW) Act 2000;
- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Protection of Badgers Act 1992;
- The Hedgerow Regulations 1997;

Bern Convention

8.2.3 The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) came into force in 1982. The principal

aims of the Convention are to ensure conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of species (including migratory species).

Habitats Directive

8.2.4 In 1992 the then European Community adopted Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, known as the Habitats Directive. The main aim of the EC Habitats Directive is to promote the maintenance of biodiversity by requiring member states to introduce protection for these habitats and species of European importance. The mechanism for protection is through designation of SACs, both for habitats and for certain species listed within Annex II.

Birds Directive

8.2.5 EC Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive) provides a framework for the conservation and management of wild birds in Europe. In this regard, Annex I of the Directive lists habitat types to be protected, and Annex II specifies conditions under which hunting can be undertaken. The Directive additionally provides for the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I, and for regularly occurring migratory species.

Conservation of Habitats and Species Regulations 2010

8.2.6 In the UK, the Habitats Directive was transposed into law by means of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended). The Regulations came into force on 30 October 1994, and have been amended several times. Subsequently the Conservation of Habitats and Species Regulations 2010 was created which consolidates all the various amendments made to the 1994 Regulations in respect of England and Wales and is commonly known as the 'the Habitats Regulations'. The Regulations contain five Parts and four Schedules, and provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites. This legislation is the principle means by which the European Union Directives on the Conservation of Wild Birds (2009/147/EC) and Habitats Directive are implemented in the UK.

Wildlife and Countryside Act 1981 (as amended)

8.2.7 The Wildlife and Countryside Act 1981 (as amended) is the principle mechanism for the legislative protection of wildlife in Great Britain. However it does not extend to Northern Ireland, the Channel Islands or the Isle of Man.

Policy

- The National Policy Statements for Energy (NPS EN-1, EN-2, EN-4 and EN-5);
- National Planning Policy Framework (NPPF) 2012; and
- Relevant local planning policy;
- The UK Biodiversity Action Plan (UK BAP); and
- Suffolk Biodiversity Action Plan (Suffolk BAP);

National Policy Statements

8.2.8 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic biodiversity impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

8.2.9 Section 4.3 of EN-1 refers to the Conservation of Habitats and Species Regulations 2010 and the requirement to consider whether a project is likely to have a significant effect on a European site either alone or in combination with other plans or Projects.

8.2.10 Paragraph 5.3.7 states “As a general principle, and subject to the specific policies below, development should aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives (as set out in Section 4.4 above); where significant harm cannot be avoided, then appropriate compensation measures should be sought.” Paragraph 5.3.8 continues “In taking decisions, the IPC should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests within the wider environment.”

8.2.11 NPS EN-1 goes on to explain the weight to be attached to particular designations and notes for example that (paragraph 5.3.13) "The IPC [Secretary of State] should give due consideration to such regional or local designations. However, given the need for new infrastructure, these designations should not be used in themselves to refuse development consent."

8.2.12 Paragraph 5.3.15 encourages the provision of biodiversity opportunities within developments.

8.2.13 Paragraph 5.3.18 seeks that the applicant demonstrates that appropriate and practicable mitigation measures are incorporated into the proposed Project. Where this is not demonstrated, the examining authority and the SoS "should consider what appropriate requirements should be attached to any consent and/or planning obligations entered into".

8.2.14 The National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2) does not set out specific assessment principles in respect of biodiversity for fossil fuel generating stations, except for the potential for aquatic ecology effects in respect of cooling water intake and exhaust, which is not relevant to the proposed Project due to the proposed use of SCGT technology with a low cooling water requirement which is likely to be supplied by tankering.

8.2.15 The National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4) notes the relevance of biodiversity in respect of the route of gas pipelines in respect of construction phase impacts and the potential constraint to planting near the route in future, and refers back to the assessment principles contained in NPS EN-1.

8.2.16 The National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) refers back to the assessment principles contained in NPS EN-1 and notes the potential impacts on birds from overhead lines. However as the Electricity Connection is to be an underground cable this is not of relevance to the proposed Project.

Other National and Local Policy

8.2.17 The NPPF (2012) sets out objectives for protecting biodiversity through the planning system. In summary, its objectives (paragraph 109) are:

- protecting and enhancing valued landscapes, geological conservation interests and soils;
- recognising the wider benefits of ecosystem services;

- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and
- remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

8.2.18 The NPPF at paragraph 118 sets out considerations which local authorities are expected to have when determining applications for planning permission. The proposed Project is a NSIP and so falls to be determined in accordance with the NPS and any other matters considered important and relevant, nonetheless it is recognised that the NPPF contains broad principles as to the types of land that are less suitable, in respect of biodiversity, for development and the importance of appropriate mitigation and identification of opportunities for biodiversity in new developments.

8.2.19 Policy CS5 of the Mid Suffolk Core Strategy 2008 (as updated by the Focused Review of 2012) seeks that development manages and enhances Mid Suffolk's biodiversity and geodiversity based on a network of designated and identified wildlife sites and corridors, and seeks that developments increase opportunities for public access and appreciation of biodiversity.

8.2.20 Saved Policy CL8 of the Mid Suffolk Local Plan (1998) seeks to avoid development that is likely to bring about the loss or significant alteration of important habitats or which threatens rare, vulnerable or legally protected species.

8.3 Project Scenario for Assessment

8.3.1 In respect of ecology, the realistic worst case scenario from within the proposed Project parameters (which are described in Section 3 of the PEIR) are set out in Table 8.1 below.

8.3.2 As set out in the Air Quality Section (Section 6) the reason that the parameters identified in Table 8.1 represent the realistic worst case in relation to ecological impacts are primarily because 5 stacks will have a potentially greater impact on air quality (and therefore sensitive ecological receptors). Further discussion is provided in Section 6.3 of this PEIR.

8.3.3 A preliminary assessment of both Gas Connection Route Corridor Options, both Electrical Connections Compound Areas, and both Electrical Connection Options is presented in this section.

Table 8.1- Realistic Worst Case Scenario for Assessment of Ecology Impacts

Parameters	Details
Number of gas turbine units	5 (~ 59 MW)
Number of stacks	5
Height of Stacks	30 m
Unit type	Aero derivative

8.4 Assessment Methodology and Significance Criteria

8.4.1 Two extended Phase 1 Habitat Surveys have been undertaken as part of the EIA. The first report was completed in May 2013 and formed an appendix to the Scoping Report. This first report considered the area of the Former Eye Airfield that included the Power Generation Plant site and the Gas Connection options to the south, located north of Castleton Way.

8.4.2 The second Phase 1 Habitat Survey report was completed in July 2013, and considered the ecology within a large area, referred to in this PEIR as the Electrical Opportunity Area (EOA) to the west of the Power Generation Plant on the far side of the A140 Road. The EOA incorporated a large area so that a number of potential Electrical Connection route corridor options and Electrical Connection Compound options could be considered, thereby providing greater scope to circumnavigate any ecological constraints present. This approach was favoured over a pre-determined corridor route in order to provide greater flexibility in the design and final location of the respective Electrical Connection and Electrical Connection Compound. .

8.4.3 The two Electrical Connection Compound options and the two Electrical Connection options, as described in Section 4 and shown on inserts 4.4 and 4.5, are within the EOA. Accordingly, Phase 1 Habitat Survey of July 2013 covers the options for the Electrical Connection Compound and the Electrical Connection.

8.4.4 The desk studies undertaken as part of the Phase 1 Habitat Surveys were undertaken to collect records of protected and notable species, and habitats within the vicinity of the Project Site. The search radius was 10 km from the site boundary for all statutory designated sites and

bat records, 2 km for non-statutory designated sites, and 1 km for all other protected / notable species.

8.4.5 As part of the first Extended Phase 1 Habitat Survey completed in May 2013, separate desk studies were carried out for the proposed Power Generation Plant site and the Gas Connections as the indicative routes proposed for the Gas Connection were likely to be later refined. However, within the second Extended Phase 1 Habitat Survey completed in July 2013, the updated desk study reflected the entire Project Site, incorporating the Power Generation Plant, the two Gas Connection options and the EOA.

8.4.6 Site walkover surveys were also undertaken to accompany the desk based assessments. The surveys followed standard methodology published by the Joint Nature Conservation Committee (JNCC), which was extended for use in Environmental Assessment by the Institute of Ecology and Environmental Management (IEEM); with habitat types present recorded on a Phase 1 habitat map. Dominant plant species observed within each habitat type were recorded in accordance with plant species nomenclature in Stace (1997).

8.4.7 Badger surveys and Great Crested Newt (GCN) Habitat Suitability Index (HSI) assessments were also undertaken alongside the two respective Phase 1 Habitat surveys. The badger survey footprint extended 30 m beyond the proposed Power Generation Plant site, the two Gas Connection options and the EOA where access and visibility allowed. The methodology was based on the standard approach detailed in Surveying Badgers (Harris et al., 1989). Particular emphasis was placed on locating badger setts and signs of territorial activity.

8.4.8 GCN HSI assessments were carried out to determine the likelihood of presence within the immediate surrounds of the Power Generation Plant. the Gas Connection options, the Electrical Connection route corridor options and the Electrical Connection Compound options. Twenty-six ponds within 500 m of the combined footprint of the Power Generation Plant and the two Gas Connection options were surveyed alongside the first Phase 1 Habitat Survey, with a further 35 ponds within 250 m of the EOA surveyed alongside the second Phase 1 Habitat Survey.

8.4.9 The Habitat Suitability Index assessment (HSI) is a tool which enables an assessment of the likelihood of a water body to support GCN. It incorporates 10 suitability indices (SI), all of which are factors thought to affect GCN.

8.4.10 The ecological features of the site have been evaluated in accordance with guidelines provided within the IEEM “Guidelines for Ecological

Impact Assessment" (2006). The guidance provides a framework for the evaluation of ecological features. It takes into account the direct biodiversity value of habitats / species, the indirect value of features which help support the ecological integrity of key features, legal protection for sites / species and evaluation against national and local planning guidance and objectives.

8.4.11 It should be noted that whilst the evaluation considers the presence of protected species that receive both legal and non-statutory protection, the simple presence of the species does not necessarily infer value at the level of protection it receives. Therefore, the value of a site for protected species is dealt with on a species by species basis, taking into account the recorded level of activity, the level of protection it receives and the overall value of habitat on that site for that species.

8.4.12 Based on the results of the Phase 1 surveys, Phase 2 protected species surveys were then undertaken. Each survey was undertaken using standard methodologies as recommended by Natural England (NE).

8.4.13 The assessment methodology employed for the ecological impact assessment (ECIA) follows the IEEM "Guidelines for Ecological Impact Assessment" (2006) and involves five key stages:

- Stage 1: Consultations; - as described above, consultations so far have concentrated on the scoping responses received to date;
- Stage 2: Baseline Studies and Evaluation of Ecological Receptors; As described above, desk studies, Phase 1 Habitat surveys and Phase 2 protected species surveys have been undertaken for the proposed Project;
- Stage 3: Identification of Valued Ecological Receptors (VER). This has been undertaken during the above steps;
- Stage 4: Identification and Characterisation of Potential Impacts. Initial impacts are outlined in this PEIR and a further characterisation of impacts will be provided in the final ES; and
- Stage 5: Assessment of Significant Effects. This stage will be completed as part of the final ES.

8.4.14 For the purposes of the ECIA, sites, species populations, species assemblages and habitats will be valued using the geographical scale detailed in Table 8.2. The valuation of sites makes use of any established systems, with examples provided in the Table. However, professional ecological judgement has been used to attribute value to receptors considered to be of district value or below. The potential likely ecological impacts from the Project during construction, operation and

decommissioning will be identified and characterised. In identifying these impacts, a number of parameters are taken into account.

Methodology to Determine Magnitude of Effects

8.4.15 The parameters used to determine the nature and magnitude of the impact are centred upon the: size or intensity of the effect, which is measured in relevant terms. For example, the number of individuals lost or gained; area of habitat lost or created; or, the degree of change to existing conditions such as noise or lighting levels. The magnitude of effects also considered the following:

- Negative or Positive Effect - Whether the effect of the impact would result in net loss or degradation of a VER or whether it would enhance or improve it.
- Extent - The spatial scope of the effect; for example: the physical area affected or the geographical pattern of the effect.
- Duration - The length of time over which the effect will occur.
- Reversibility - The extent to which effects are reversible, either spontaneously or through active mitigation.
- Timing and Frequency - Consideration of the timing of events in relation to ecological change. Some effects may be of greater significance if they take place at certain times of year such as during the breeding bird season. The extent to which an effect is repeated may also be of importance.

8.4.16 Furthermore, impacts can be permanent or temporary, direct, secondary or indirect and can be cumulative.

8.4.17 These factors are brought together to assess the magnitude of the impact on particular VERs and, wherever possible, the magnitude of the impact is quantified.

8.4.18 Professional judgment is then used to assign the effects on the receptors to one of four classes of magnitude, defined in Table 8.2.

Table 8.2 - Definition of Magnitude

Magnitude	Definition
Severe	A permanent or long-term impact on the extent, size or integrity of a site, habitat, species assemblage or community, population or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to enhance its conservation status.
Major	A permanent or long-term impact on the extent or size or integrity of a site, habitat, species assemblage or community, population or group. If adverse, this is unlikely to threaten its sustainability; if beneficial; this is likely to be sustainable but is unlikely to enhance its conservation status.
Moderate	A permanent or long-term reversible impact on a site, habitat, species assemblage or community, population or group whose magnitude is detectable but would not threaten its integrity.
Minor	A short-term, reversible impact on the extent or size or integrity of a site, habitat, species assemblage or community, population or group that is within the normal range.
Not significant	No impact or an impact which is beneath the level of perception, within normal bounds of variation or within the margin of error of the ecological assessments.

Methodology to Determine Value

8.4.19 The value of sites, habitats, species assemblages and populations of species is evaluated with reference to both their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations) and their legal status.

8.4.20 A review of the legislation, policy and sensitivity of the ecological receptor is undertaken and the value of the receptor was determined within a geographical context on the following basis:

- International;

- UK / National;
- Regional;
- Authority Area (e.g. County or District);
- Local or Parish; and
- Site, within the Ecological Survey Area only.

8.4.21 Accordingly, Table 8.3 (adapted from Ratcliffe8) outlines the criteria taken into consideration for evaluating the value of both habitats and species.

8.4.22 It should be noted that the description and valuation of ecological receptors takes account of any likely changes, including (for example): trends in the population size or distribution of species; likely changes to the extent of habitats; and, the effects of other proposed developments or land-use changes.

[8] Ratcliffe, D.A. (Ed.) (1977) A Nature Conservation Review. Cambridge University Press, Cambridge

Table 8.3 - Example of criteria used to evaluate Ecological Receptors

Level of Value	Examples of Definitions
International	An Internationally Important Site, e.g. SPA, SAC or Ramsar site (or a site considered worthy of such designation); a regularly occurring population of an internationally important species (listed on Annex IV of the Habitats Directive).
National (UK)	A Nationally Designated Site, e.g. Site of Special Scientific Interest (SSSI), or a site considered worthy of such designation; 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; any regularly occurring population of a nationally important species, e.g. listed on Schedules 5 and 8 of the Wildlife & Countryside Act (1981); a feature identified as of priority in the UK Biodiversity Action Plan (BAP).
County	Areas of Internationally or Nationally Important Habitats which are degraded but are considered readily restored; viable areas of key habitat identified in Local BAPs, or smaller areas of such habitat which are essential to maintain the viability of a larger whole; a site designated as a Site of Nature Conservation Interest (SNCI) or a Local Wildlife Site (LWS); a regularly occurring, locally significant number of a nationally important species.
District	Areas of Habitat identified in a Sub-County (District / Borough) or in the relevant Natural Area profile; district sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves; sites or features that are scarce within the district or borough or which appreciably enrich the district or borough habitat resource; a diverse or ecologically valuable hedgerow network.
Local	Areas of Internationally or Nationally Important Habitats which are degraded and have little or no potential for restoration; a good example of a common or widespread habitat in the local area.
Neighbourhood (site and its vicinity, including areas of habitats contiguous with or linked to those on site)	Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest; common and widespread species.

Methodology for Assessing Significance

8.4.23 The significance of the predicted effects on VERs arising from the identified impacts of the proposed Project, including designed-in and additional mitigation measures are assessed.

8.4.24 Significance is assessed as being Negative, Positive or Not Significant.

Negative

8.4.25 For habitat and species, a negative effect is considered to be significant if the favourable conservation status of a VER is compromised by the final design of the Project. Conservation status is defined by IEEM (2006) as being, for Habitats:

8.4.26 “Conservation status is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area.”

8.4.27 The IEEM (2006) definition of conservation status, for species, is:

“Conservation status is determined by the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area.”

8.4.28 The decision as to whether the favourable conservation status of a VER is likely to be compromised is made using professional judgement based on an analysis of the predicted effects of the proposed Project (including consideration of the specific parameters outlined above).

8.4.29 A similar procedure is used for statutory ecological designated sites that could be affected, except that the focus is on the effects on the integrity of each site, defined by IEEM as:

“the coherence of ecological structure and function, across a site’s whole area, that enable it to sustain the habitat, complex of habitats and / or levels of populations of species for which it was classified.”

8.4.30 This assessment is made with reference to the features for which a site has been classified / notified and involves combining assessments of the effects on the conservation status of each of these features.

8.4.31 For non-statutory ecological designated sites, such features may not have been formally defined and in these cases a description of the site (and where possible the reason for designation) is used to assess the likely habitats and species within these sites. This information is gained primarily from the desk studies.

Positive

8.4.32 A positive effect is considered to be significant if development activities cause:

- A non-valued ecological receptor to become valued;
- Restoration of favourable conservation status for a habitat / species population;
- and / or
- Restoration of the integrity of a site (where this has been undermined).

8.4.33 The complete significance assessment will be undertaken following the full analysis of data and will be presented in the forthcoming ES. The assessment will consider the potential impacts from all aspects of the development on each individually identified VER. However, this PEIR sets out a preliminary assessment, including of significance, of the likely significant environmental effects of the proposed Project on ecology.

8.4.34 An assessment of the residual impacts, post-mitigation, will also be made.

8.5 Embedded Design Mitigation

8.5.1 The proposed Project has been designed from the outset to ensure its impacts are minimised. This includes mitigation that is embedded into the design of the Power Generation Plant, Gas Connection, Electrical Connection Compound and Electrical Connection, including industry standard methods and procedures to ensure impacts from construction, operation and decommissioning are minimised.

8.5.2 Embedded mitigation measures to limit impacts on ecology and biodiversity could include ensuring that no construction or vegetation clearance takes place within breeding bird season or during other sensitive ecological seasons. If necessary, further, specific mitigation measures will include the consideration for provision of new habitat to suitably replace any habitat areas which are permanently lost through development of the Power Generation Plant, Gas Connection, Electrical Connection Compound and Electrical Connection.

8.5.3 The assessment in this section takes such design mitigation into account.

8.6 Consultation

8.6.1 Table 8.4 below provides a summary of scoping responses relating to the potential impacts on Ecology and set out the actions that have been undertaken, or will be undertaken to address them.

Table 8.4 – Scoping Consultation

Reference	Comment	Actions
PLANNING INSPECTORATE		
3.29	The SoS draws the applicant's attention to the comments of NE (see Appendix 2) regarding the approach to the ecological assessment.	Will be addressed in ES through use of standard methodology
3.30	The SoS recommends that surveys should be thorough, up to date and take account of other development proposed in the vicinity.	Protected species surveys are currently underway in accordance with relevant best practice and guidance and neighbouring developments will be addressed in ES
3.31	The SoS recommends that the proposals should address fully the needs of protecting and enhancing biodiversity. The assessment should cover habitats, species and processes within the site and its surroundings. The SoS draws attention in particular, but not exclusively, to the effects on bats, breeding birds, wintering birds and great crested newts. The SoS notes the submission of the 2013 Extended Habitat Survey and welcomes the inclusion of non-statutory designated sites.	Protected species surveys are currently underway addressing these species (and others) and ES will address potential ecological impacts and mitigation requirements.
3.32	The potential impacts on international and nationally designated sites should be assessed as well as county level habitats. The SoS notes the possible need for an Appropriate Assessment in view of the development site's location in relation to Redgrave and South Lopham Fens Ramsar site and Waveney and Little Ouse Valley Fens SAC. Further information is provided in Section 4 of this Scoping Opinion.	ES will address this. An HRA Screening Assessment will additionally be undertaken to determine the need for an Appropriate Assessment.

3.33	The assessment should take account of impacts on noise, vibration, water management and air quality (including dust), and cross reference should be made to these specialist reports.	ES will address this.
3.34	The operational and decommissioning phases of the works should be addressed. The SoS recommends the need to consider cumulative impacts and advises this is particularly relevant in terms of assessing the impacts on ecology.	ES will address this.
3.46	The Applicant's attention is drawn to the comments of NE regarding the need to consider the potential impacts on biodiversity resulting from the loss of existing vegetation; appropriate cross reference should be made to the ecology section.	Protected species survey underway and ES will address this.
4.12	The SoS considers that there is potential for the presence of EPS within the study area for the proposed development. Where a potential risk to an EPS is identified and before making a decision to grant development consent the CA must, amongst other things, address the derogation tests in Regulation 53 of the Habitats Regulations. Therefore the Applicant may wish to provide information which will assist the decision maker to meet this duty. Where required the Applicant should, in consultation with NE, agree appropriate requirements to secure necessary mitigation.	Protected species survey underway and ES will address this.
4.13	If the Applicant has concluded (in consultation with NE) that an EPS licence is required the ExA will need to understand whether there is any impediment to the licence being granted. It would assist the examination if the Applicant could provide with the application confirmation from NE whether they intend to issue the licence in due course.	Protected species survey underway and ES will address this. Further consultation with NE may be required and will be undertaken as necessary subject to the results of the surveys and impact assessment.

MID SUFFOLK DISTRICT COUNCIL		
p.2	The Council would draw the applicant's attention to the comments made by Suffolk County Council, particularly in relation to the linkages between the landscape visual and ecological implications of the proposal. As indicated in the County Council's response the ES should not only give consideration to the mitigation of the proposal but also the opportunities that exist to enhance local biodiversity. In this regard there is extensive knowledge within the local community.	This will be addressed within the ES.
NATURAL ENGLAND		
2.1	**Ecological Aspects of an Environmental Statement** Natural England advises that the potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance on such matters. Guidelines for Ecological Impact Assessment (EcIA) have been developed by the Institute of Ecology and Environmental Management (IEEM) and are available on their website. EcIA is the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components. EcIA may be carried out as part of the EIA process or to support other forms of environmental assessment or appraisal. The National Planning Policy Framework sets out guidance in S.118 on how to take account of biodiversity interests in planning decisions and the framework that local authorities should provide to assist developers.	The EcIA will be undertaken in accordance with the IEEM Guidelines for EcIA and with reference to relevant documents and policies such as NPPF, and will be presented in the ES.
2.2	**Internationally and Nationally Designated Sites**	This will be addressed within the EcIA within the Ecology Section of

	The ES should therefore thoroughly assess the potential for the proposal to affect designated sites. European sites, e.g. designated Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), fall within the scope of the Conservation of Habitats and Species Regulations 2010 (as amended). In addition paragraph 169 of the National Planning Policy Framework requires that potential SPAs, possible SACs, listed or proposed Ramsar sites, and any site identified as being necessary to compensate for adverse impacts on classified, potential or possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites. Under Regulation 61 of the Conservation of Habitats and Species Regulations 2010 an Appropriate Assessment needs to be undertaken in respect of any plan or project which is (a) likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site. Should a Likely Significant Effect on a European/Internationally designated site be identified or be uncertain, the competent authority (in this case the Secretary of State for Department of Energy and Climate Change) may need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process.	the ES. An HRA Screening Assessment will additionally be carried out.
2.3	**Sites of Special Scientific Interest (SSSIs) and sites of European or international importance (Special Areas of Conservation, Special Protection Areas and Ramsar sites)** The development site is within 10km of the following nationally designated nature conservation sites: Redgrave & Lopham Fens SSSI Redgrave & Lopham Fen National Nature Reserve	Impacts on designated sites will be addressed within the ES. Further consultation with NE will be undertaken regarding the potential for likely significant effects on Natura 2000 / European Sites. An HRA Screening

	Wortham Ling SSSI Burgate Wood SSSI Gypsy Camp Meadows, Thrandeston SSSI Major Farm, Braiseworth SSSI Hoxne Brick Pit SSSI Westhall Wood and Meadow SSSI Shelfanger Meadows SSSI Further information on these SSSIs and their special interest features can be found at www.natureonthemap.naturalengland.org.uk .The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within these sites and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects. The development site is within 10km of the following internationally and European designated nature conservation sites: Redgrave & South Lopham Fens Ramsar site Waveney & Little Ouse Valley Fens SAC Natura 2000 Network site conservation objectives are available on our internet site here In this case the proposal is not directly connected with, or necessary to, the management of a European site. In our view it is likely that it will have a significant effect on internationally designated sites and therefore will require assessment under the Habitats Regulations. We recommend that there should be a separate section of the Environmental	Assessment will be undertaken to determine likely significant effects and to inform the need for, and content of a Statement to Inform an Appropriate Assessment. The EcIA will address potential impacts in respect of air pollution and will cross refer to the relevant Air Quality section within the ES.

	Statement to address impacts upon European and Ramsar sites entitled „Information for Habitats Regulations Assessment". The list of issues that the „Information for Habitats Regulations Assessment" should cover are, but not exclusively limited to, the following assessments on the internationally designated site features: the likely impacts of the gaseous emissions to air from the operation of the proposed power generation plant the likely impacts of any increased water abstraction and waste water discharge, both during construction and operation, of the proposed Power Generation Plant and Gas Connection. Air quality in the UK has improved over recent decades but air pollution remains a significant issue; for example over 97% of sensitive habitat area in England is predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition (England Biodiversity Strategy, Defra 2011). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The planning system plays a key role in determining the location of developments which may give rise to pollution, either directly or from traffic generation, and hence planning decisions can have a significant impact on the quality of air, water and land. In terms of assessing the impact on air quality, we advise that a radius of 10km around the application site is searched for international and European designated sites (i.e. SPAs, SACs and Ramsar sites) and a radius of 2km for nationally designated sites (i.e. SSSIs). Non-statutory local sites (e.g. County Wildlife Sites) near to the application should also be considered. The assessment should take account of the risks of air pollution and how these can be managed or reduced. Further information on	

	air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (www.apis.ac.uk). Further information on air pollution modelling and assessment can be found on the Environment Agency website.	
2.4	**Regionally and Locally Important Sites** The EIA will need to consider any impacts upon local wildlife and geological sites. Local sites are identified by the local Wildlife Trust, geoconservation group or a local forum established for the purposes of identifying and selecting local sites. They are of county importance for wildlife or geodiversity. The Environmental Statement should therefore include an assessment of the likely impacts on the wildlife and geodiversity interests of such sites. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures. Contact the Suffolk Biological Records Centre and Norfolk Biodiversity Information Service for further information.	ES will address this.
2.5 p.4	**Protected Species** Protected species are species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2010. The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newts, reptiles, birds, water voles, badgers and bats). Natural England does not hold comprehensive information regarding the locations of species protected by law, but advises on the procedures and legislation relevant to such species. Records of protected species should be sought from appropriate	Relevant protected species surveys are underway in accordance with applicable best practice and standard methodologies. The EcIA will cover the assessment of impacts on protected species, the relevant mitigation requirements, and any licensing requirements, which will be presented in the Ecology Section of the ES.

	local biological record centres, nature conservation organisations, groups and individuals; and consideration should be given to the wider context of the site for example in terms of habitat linkages and protected species populations in the wider area, to assist in the impact assessment. The conservation of species protected by law is explained in Part IV and Annex A of Government Circular 06/2005 Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System. The area likely to be affected by the proposal should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES. In order to provide this information there may be a requirement for a survey at a particular time of year. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and where necessary, licensed, consultants. Natural England has adopted standing advice for protected species which includes links to guidance on survey and mitigation.	
2.5 p.5	**Habitats and Species of Principal Importance** The ES should thoroughly assess the impact of the proposals on habitats and/or species listed as as „Habitats and Species of Principal Importance" within the England Biodiversity List, published under the requirements of S41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act 2006 places a general duty on all public authorities, including local planning authorities, to conserve and enhance biodiversity. Further information on this duty is available in the Defra publication „Guidance for Local Authorities	Relevant species surveys are underway. Impacts on, and mitigation requirements in respect of Habitats and Species of Principle Importance, will be covered within the EcIA / ES where applicable. Where possible the scheme design will take into account recommendations in respect of habitats and species in

	on Implementing the Biodiversity Duty". Government Circular 06/2005 states that Biodiversity Action Plan (BAP) species and habitats, „are capable of being a material consideration…in the making of planning decisions". Natural England therefore advises that survey, impact assessment and mitigation proposals for Habitats and Species of Principal Importance should be included in the ES. Consideration should also be given to those species and habitats included in the relevant Local BAP. Natural England advises that a habitat survey is carried out on the site, in order to identify any important habitats present. In addition, ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year, to establish whether any scarce or priority species are present. The Environmental Statement should include details of: Any historical data for the site affected by the proposal (e.g. from previous surveys); Additional surveys carried out as part of this proposal; The habitats and species present; The status of these habitats and species (e.g. whether BAP priority habitat); The direct and indirect effects of the development upon those habitats and species; Full details of any mitigation or compensation that might be required. The development should seek if possible to avoid adverse impact on sensitive areas for wildlife within the site, and if possible provide opportunities for overall wildlife gain. The record centre for the relevant Local Authorities should be able to provide the relevant information on the location and type of BAP	order to minimise adverse impacts.

	habitat for the area under consideration.	
2.6	**Contacts for Local Records** Natural England does not hold local information on local sites, local landscape character and local or national biodiversity priority habitats and species. We recommend that you seek further information from the appropriate bodies (which may include the local records centre, the local wildlife trust or other recording society and a local landscape characterisation document).	The Extended Phase 1 Habitat Assessments of the Power Generation Plant site and Gas Connection options and the Electrical Connection and Electrical Connection Compound options undertaken in 2013 have addressed this through the inclusion of a detailed desk study.
NORFOLK COUNTY COUNCIL		
5.3	The ES/EIA will need to address the potential impact on Ecology, including in particular, impact on the following interests: designated sites e.g. Sites of Special Scientific Interest (SSSI), National Nature Reserves, Special Protection Areas (SPA), Special Area for Conservation (SAC), County Wildlife Sites (CWS) etc; and Birds. The need to consider cumulative impact is a requirement of the EIA process. This is of particular importance when considering ecological impacts. Projects to be incorporated in such an assessment must include those in the past, present and foreseeable future. Projects to be incorporated in such an assessment must include not only other potential wind farms but also other types of project taking place in the marine environment or onshore so that all elements of the infrastructure are assessed. For further information on landscape and ecology matters please call Heidi Thompson on [redacted]	ES will address these issues / items.

SUFFOLK COUNTY COUNCIL		
33	The scoping surveys appear to be based on current and local Suffolk Biological Records Centre (SBRC) data which should enable robust assessment of potential impacts on ecology from the construction of the power station and associated utility connections. SCC does request that all additional data collected is made available to the Suffolk Biological Records Centre.	All data collected through the ecological surveys currently underway will be submitted to the local record centre.
34	Regarding surveys of habitats and species, SCC has not reviewed the ecological scoping report carried out by MSDC in 2011 (5.5.4). Nevertheless, while we accept that the hedgerows, scrub and trees are the main habitats which require assessment for protected species, it should be noted that arable field margins are a BAP habitat and this should be added to the scoping surveys so that the impacts of the power generation plant and connection options on any arable plants as well as farmland birds are adequately assessed.	A preliminary assessment is provided in this PEIR and will be further investigated in the final ES.
35	While the undergrounding of the Electrical Connection would have landscape and visual benefits, burial is likely to require a significant wayleave which can lead to the severance of ecological corridors such as any crossing of Ley Lane for example. Therefore proposals for the use of trenchless methods and other mitigation methods are likely to be required when considering the results of surveys identified in paragraph 5. 5.16.	A preliminary assessment of these impacts is provided in this PEIR and will be further investigated in the final ES.
36	With respect to both the Gas and Electrical Connection options, there is particular crossover between the assessment of	Protected species surveys are underway and an ecological

	landscape, visual and ecological effects in the impacts of hedgerows and hedgerow trees. From an ecological perspective it is particularly important that all veteran trees (see EN-1 5.3.14) that may be affected are identified and that all hedgerows where bat passes are recorded are identified and recognised as important.	constraints plan will be produced to inform the design options. ES will also address this.
37	Clarification regarding the identified Site of Importance for Nature Conservation (SINC) on Progress Industrial Estate (5.5.25) is required. There is no County Wildlife Site (CWS) on the airfield in the CWS register for Mid Suffolk and we therefore need additional information regarding the ecological value of this site before assessing the survey and assessment needs for it.	This was an error in the Scoping Report. No such SINC exists within the former Eye Airfield.
38	Notwithstanding the comments at paragraph 34 above, we are content that the proposed species surveys for protected and BAP species are reasonable. Mitigation measures will need to be identified for European Protected Species (bats and Great Crested Newts) and for Brown hare.	Protected species surveys are underway and ES will address this.
39	We welcome the intention to undertake a Habitats Regulation Assessment (HRA) Screening Exercise (5.5.35) and suggest that reference to a shadow HRA screening report for PINS is included in the ES.	Work on this is ongoing and will be included in the ES as requested.
40	In addition to embedded mitigation (5.5.36), we would welcome early discussion of the potential requirements regarding specific measures to minimise any impacts on protected species.	Production of an ecological constraints plan to inform design and ES will address this.
41	In accordance with EN-1, paragraph 5.3.4, the applicant should seek to take advantage of opportunities to conserve and enhance biodiversity – for example through discussion of opportunities to enhance the local ecological network.	Opportunities for enhancement will be considered once the connection options have been finalised and details will be

	Furthermore, offsetting of any residual impacts outside the red line boundary may need to be considered. Defra has produced some Guiding Principles and an accompanying technical paper outlining the relevant metrics.	provided in the ES.
YAXLEY PARISH COUNCIL and THRANDESTON PARISH COUNCIL		
1	Areas of assessments The area intended to be covered by some of the assessments is not large enough to give a comprehensive picture of the impact that a development of this magnitude might have on the surrounding environment. The area covered by assessments relating to ... Ecology... a minimum radius of 5 kilometres.....	ES will address and define the Zone of Influence of the proposed development.

8.7 Baseline Conditions and Receptors

Power Generation Plant and Gas Connections

8.7.2 During the Phase 1 Habitat Surveys and associated desk studies, twenty nine statutory designated sites were identified within the 10 km search radius, although only two of these are of international importance and seven of national importance. The remainder of the statutory designated sites are ancient woodland. Two non-statutory designated sites were noted within the 2 km search radius. Records were received for a number of protected and notable species within the search area including bats, birds, amphibians, invertebrates and plants.

8.7.3 The Phase 1 Habitat survey area comprises an arable landscape, with hedgerows, dense scrub, scattered trees and hardstanding along the respective arable boundaries, with a small linear plantation to the east. Industrial areas are located on the far side of these features to the north, east and west, with further arable land around the remaining aspects. The A140 road is located to the west of both sites.

8.7.4 The Power Generation Plant and the two Gas Connection options did not support any semi-mature or mature trees which would otherwise warrant a bat tree inspection. No further survey work was therefore deemed necessary in respect of roosting bats.

8.7.5 No badger setts or signs of badger activity were noted during the survey of the proposed Power Generation Plant or the Gas Connection options to the south (those to the north and east were later added within the second Phase 1 Habitat Survey). No evidence of latrines, pathways or snuffle holes was found along the arable margins or accessible grassland areas beyond the site boundary during either survey. No badger pathways were similarly discovered although the presence of a nearby roadkill indicates badgers are active in the wider area. Occasional through passage cannot therefore be entirely discounted from either site.

8.7.6 The results of the pond HSI indicate that the proposed Power Generation Plant site and the two Gas Connection options hold limited terrestrial potential for GCN (there are no ponds on-site within the Power Generation Plant for GCN to breed). The terrestrial habitat is considered sub-optimal for GCN although the surrounding pond density, particularly to the west of the A140, is considered to be conversely strong. The occurrence of this species could not therefore be discounted entirely from within the Power Generation Plant and the two Gas Connection options, although the A140 Road is likely to serve as a major dispersal barrier.

8.7.7 Seven ponds / ditches (ponds 4, 6, 7, 8, 9, 13, and ditch 14 as shown on Figure 8.1) were considered to score sufficiently high to warrant further survey. Four GCN surveys were therefore recommended to determine presence / likely absence from those suitable ponds within 250 m of the Power Generation Plant and the Gas Connection options to the south.

8.7.8 In addition, Phase 2 species surveys were also recommended for breeding birds, wintering birds and bats in order to determine presence / absence, levels of activity and species diversity. The results of these Phase 2 surveys will later inform a full assessment of potential impacts resulting from these two elements of the proposed Project, which will be presented in the Ecology Section of the ES.

Electrical Connection Compound Areas and Connection Corridors

8.7.9 The desk study identified the presence of 36 statutory designated sites (including ancient woodland) within 10 km of the proposed Project Site, although only two of these are of international importance and eight of national importance. The remainder of the statutory designated sites which are of regional / local importance include two Local Nature Reserves and 24 ancient woodland sites. Seven non-statutory designated sites were noted within the 2 km search radius. Records were received for a number of protected and notable species within the search area including bats, birds, brown hares, GCN, hedgehogs, invertebrates, plants, reptiles and water voles.

8.7.10 A Phase 1 Habitat Survey of the EOA was first undertaken on 3rd May 2013 using permissive pathways, with the remainder of the site surveyed on 12th and 13th June 2013 after access was obtained.

8.7.11 The survey area comprises a largely arable landscape which is intersected by hedgerows, dense scrub, scattered trees and small woodland plantations. Smaller areas of buildings and hardstanding, and semi-improved grassland also occur in the northern, eastern and western areas of the site. The proposed Project site is bounded by industrial areas to the north-east (forming Eye Industrial Airfield Estate) with further arable land across all remaining aspects.

8.7.12 A badger survey was also undertaken alongside the Phase 1 Habitat Survey on 12th and 13th June 2013. The survey footprint extended 30 m beyond the proposed Project site (excluding those areas which were surveyed in the preceding Phase 1 Habitat Survey) where access and visibility allowed.

8.7.13 No badger setts or signs of badger activity were noted during the survey of the proposed Project site. No evidence of latrines, pathways

or snuffle holes was found along the arable margins or accessible habitats beyond the site boundary. No badger pathways were similarly discovered although a previous roadkill detailed within the preceding report confirmed badger activity in the wider area. Occasional through passage cannot therefore be entirely discounted from the collective proposed Project site.

8.7.14 A GCN HSI assessment was also carried out at the same time as the Phase 1 Habitat Survey to determine the likelihood of presence within water bodies within the immediate surrounds of the Electrical Connection route corridor options and the Electrical Connection Compound options (the remainder of the proposed Project was covered in the preceding Phase 1 Habitat Survey report). Thirty-five water bodies within 250 m of the EOA were surveyed on 12th and 13th June 2013.

8.7.15 Thirteen water bodies were considered to score sufficiently high to warrant further survey, although access was not granted for six of these. Three ditches were also considered unsuitable for means of survey despite a favourable HSI score due to shallow water levels. Only four water bodies, alongside those specified within the preceding Phase 1 Habitat Survey report, were therefore included within further GCN presence / absence surveys.

8.7.16 Four GCN surveys were required to determine presence / likely absence from those suitable ponds within 250 m of the proposed Project.

8.7.17 A bat tree inspection was also undertaken alongside the Phase 1 Habitat Survey on 12th and 13th June 2013. The aim of the bat tree inspection was to collate information relating to the location of confirmed bat roosts and / or suitable trees with structural potential to support bat roosts to inform the respective ecological constraints plan in relation to bat tree roosts which is provided within Figure 8.2.

8.7.18 Sixty-five trees were inspected for signs of bats / bat roosting potential, 55 of which were considered to have varying levels of potential to support roosting bats.

8.7.19 Twelve trees in total were noted for their potential to support bat roosts (of varying categories) within the broad areas identified for Electrical Connection Options 1 and 2 and Electrical Connection Compound Options 1 and 2. No confirmed roosts were identified during the on the ground surveys within these areas and none have been identified to date during the activity surveys May to August.

8.7.20 No further surveys (i.e. aerial inspections and / or emergence and re-entry surveys) are required unless there remains no reasonable alternative in terms of the positioning of the works footprint to otherwise avoid and circumnavigate those trees with bat roosting potential.

8.7.21 Breeding bird and reptile surveys were already commissioned prior to the Phase 1 Habitat Survey . The Phase 2 species survey results will later be used to inform the detailed design in order to minimise potential impacts on the ecological receptors.

Phase 2 Species Specific Surveys

8.7.22 As part of the Phase 2 survey effort for the proposed Project the following protected species surveys were commissioned: badger, bat (activity), breeding bird, great crested newt and reptile. In line with the desk study and field results from the Phase 1 Habitat Survey, further Phase 2 survey work for dormouse, invertebrate, plant (National Vegetation Classification (NVC)), otter and water vole was scoped out due to either likely absence or low corresponding biological interest; these surveys were not therefore considered necessary.

8.7.23 Although Phase 2 wintering bird surveys were originally recommended within the initial Phase 1 Habitat Survey, due to a number of factors this survey requirement was subsequently considered unnecessary and as such its omission is not considered to affect the robustness of baseline information available to inform the ecological impact of the proposed Project. This decision was also subsequently deemed applicable to the Electrical Connection and Electrical Connection Compound and was therefore omitted from the respective Phase 1 Habitat Survey report.

8.7.24 The omission of the winter bird surveys is based on the following factors:

- the small Power Generation Plant footprint on arable land;
- the widespread availability of arable farmland in the wider environs;
- the availability of wintering bird survey data completed for an adjacent wind turbine development; and
- the careful design of precautionary mitigation in terms of works location (with respect to the Gas Connection, Electrical Connection and Electrical Connection Compound) and methods which can be employed to minimise disturbance and therefore impacts.

8.7.25 With respect to the Phase 2 surveys that have already been commissioned and are either complete or underway, a summary of the final results / results to-date are provided in Table 8.5 below.

Table 8.5 - Phase 2 Species Survey Requirements and Progress to date

Species	Survey Requirement and Timing	Survey Results
Badger survey	One survey visit (depending on the site size and complexity) carried out at anytime of the year. Autumn and early spring however represent the optimal times of survey.	No signs of badger were noted within the Project Site although the discovery of a nearby road kill confirms presence within the wider surrounds. Updated badger surveys may be required closer to the time of the proposed construction of the proposed Project to establish any changes in the badger status. Timings will be allowed to address any need for badger licence/s (July to November). Mitigation would be employed accordingly as required.
Bats (tree inspection)	One survey visit (depending on the site size and complexity) carried out at anytime of the year. Autumn and winter however represent the optimal times of survey.	Sixty-five trees (some of which are groups of trees) were inspected from the ground for signs of bats / bat roosting potential, 55 of which were considered to have varying levels of potential to support roosting bats. No confirmed roosts were however recorded during the ground based surveys. Staining was noted beneath a woodpecker hole on one tree and therefore further investigative survey work (i.e. a tree climbing survey by a licensed bat ecologist) will need to be undertaken if the preferred Electrical Connection cannot be designed to reasonably avoid this tree. Fourteen trees (all of which are located within the EOA) were recorded as Category 1* (having multiple, highly suitable features capable of supporting larger roosts), 12 trees as Category 1 (with definite bat potential, supporting fewer suitable features than

		Category 1* trees or potential for use by single bats), 29 as Category 2 (trees with no obvious potential, although of size and age that features higher up may have otherwise been concealed or overlooked; or trees which support some features which may have limited potential to bats), and 10 Category 3 (trees with no bat potential). There are no trees with any bat roosting potential within the Power Generation Plant Site or the two Gas Connection options. Twelve trees with varying degrees of bat potential have been identified within the two Electrical Connection Compound options and the two Electrical Connection options. No ecological constraints however are envisaged to roosting bats within the broad areas identified for the two Electrical Connection options and the two Electrical Connection Compounds unless the proposed routes and siting of the compounds cannot otherwise be designed to purposefully circumnavigate those trees with potential, particularly any trees which are of the highest potential (Category 1 or above) for roosting bats. There are no ecological constraints in respect of Category 2 and Category 3 trees, although precautionary mitigation measures may be necessary in respect of any Category 2 trees that may be affected by the proposed works. Such measures may include soft felling, segmental removal of limbs and ecological supervision during works.
Bats (activity survey)	Monthly surveys carried out between spring and autumn, one of which comprises a dusk and dawn	Three monthly surveys (May, June and July) carried out, the last of which incorporated a dusk and dawn survey effort. Low levels of bat activity have so far been recorded across the proposed Project site with only three common bat species recorded (common pipistrelle [*Pipistrellus pipistrellus*], noctule [*Nyctalus noctula*] and soprano pipistrelle [*P.pygmaeus*]). No bat roosts have been identified during the activity surveys.

	survey.	No ecological constraints are therefore envisaged with regards to bat activity to date.
Breeding bird survey	Three surveys undertaken spring - early summer.	All three surveys have been completed between the beginning of June and end of July 2013, with hobby (*Falco subbuteo*) and barn owl (*Tyto alba*) nests identified within the central area of the EOA. Both species are listed as Wildlife and Countryside Act 1981, as amended, Schedule 1 species, and as such it is an offence to intentionally or recklessly disturb this species at, on, or near an active nest site. However, neither nest is likely to form an ecological constraint to the Power Generation Plant, the two Gas Connections and the two Electrical Connection route options and Electrical Connection Compound options based on the existing proposed locations and routes. . The survey results also highlighted the presence of 10 species that are Red Listed within the Birds of Conservation Concern, BoCC, and nine that are Amber Listed, 12 BAP Priority Species / Section 41 NERC, and eight Suffolk BAP Priority Species. However, most of these species (excluding ground nesting birds) do not provide an ecological constraint to the proposed Project based on the proposed location for the Power Generation Plant and the options for the Gas Connection, Electrical Connection and Electrical Connection Compound providing that the Gas Connection and the Electrical Connection and the Electrical Connection Compound are carefully designed and sited within one of the proposed options to minimise the impact on hedgerows and field margins, as these habitats in particular is likely to be of significant value to breeding birds. The corresponding potential for adverse impacts on ground nesting birds, such as Eurasian skylark (*Alauda arvensis*) and grey partridge

		(*Perdix perdix)*, could be offset with the provision of compensatory habitat.
Great crested newt survey	Four surveys to determine presence, two additional surveys to complete population assessment if GCN are found. Surveys carried out in spring / early summer, with half completed between mid-April and mid-May.	The great crested newt (GCN) (*Triturus cristatus*) presence / absence surveys were completed in May and June 2013. The results of the surveys indicate that GCN are present in one water body approximately 500m north-west of the footprint of the Electrical Connection and Compound option 1. Additional surveys to determine population size were not carried out at this pond as the distance is such that the additional information would not have altered the corresponding impact assessment of the works in relation to GCN. Given the 500m distance, any impacts arising are considered to be low-negligible. With the inclusion of basic mitigation measures, including the timing and method of works, effects on GCN are considered likely to be not significant. The inclusion of such measures may negate the need for a European Protected Species (EPS) derogation licence. One pond was found to be located within 250m of the Power Generation Plant where connectivity to the site was not severed by areas of hardstanding and roads. Survey in this location was not possible as a result of health and safety. In order to compensate for the lack of survey in this location, presence is assumed as a precaution. Limited suitable terrestrial habitat was available for GCN and it is considered that corresponding effects will not be significant with the addition of basic mitigation, including the timing and method of works. In all other locations relating to the two Gas Connection options and the two Electrical Connection route options and Electrical Connection Compounds, a 250 m buffer has been provided around each unsurveyed pond to highlight the potential risk of presence in these

		areas. Where appropriate, as a result of barriers to dispersal (such as roads), the 250m buffer has been reduced. The final positioning of the Gas Connection, the Electrical Connection and the Electrical Connection Compound will avoid these buffers to remove the potential for impacts. If avoidance is not possible (either wholly or partially), then further survey may be required to inform the impact assessment and mitigation required.
Reptiles	Seven survey visits carried out over the course of spring – early summer and early autumn.	All reptile surveys have been completed and no reptiles have been discovered during these targeted reptile surveys. It should be noted that an incidental sighting of a grass snake was made during a GCN survey near Home Farm to the north, well outside of the application area. The habitats within the application site are considered to be of low quality to support grass snake but it is not possible to rule out their presence or passage across certain areas within the application area as described below. The fragmented habitat within the Power Generation Plant is not considered to be suitable to support grass snake or its passage. The habitat proposed for the Gas Connection Route 1 is not considered large enough to support grass snake in its own right. The habitat proposed for the Gas Connection Route 2 has been cleared in the past and there are barriers to grass snake dispersal. The habitat within the areas proposed for the Electrical Connections and Compounds 1 and 2 have potential to support grass snake in those areas that support water bodies. It is assumed that the final design will take account of hedgerows and field margins around water bodies with potential to support grass snake and these areas will be avoided. If this is not possible

		appropriate mitigation would be designed to ensure legal compliance and no detriment to the species.

8.8 Preliminary Assessment of Potential Impacts

POWER GENERATION PLANT

8.8.2 A Habitat Regulations Assessment (HRA) Screening will be conducted to identify any potential impacts on internationally designated sites. This exercise will determine the requirement for an Appropriate Assessment in view of the Power Generation Plant's location in relation to Redgrave and South Lopham Fens Ramsar site and Waveney and Little Ouse Valley Fens SAC.

8.8.3 The internationally designated sites are located greater than 7 km from the Power Generation Plant and direct impacts are considered negligible. It is considered that indirect impacts associated with air quality issues during the operation phase may give rise to likely significant environmental effects.

8.8.4 No direct impacts on sites of National, Regional or Local importance are envisaged as a result of the Power Generation Plant. Indirect impacts resulting during the construction, operation and decommissioning of the Power Generation Plant may give rise to likely significant environmental effects.

8.8.5 It should be noted that only those species for which potential impacts are present have been referenced and addressed below.

8.8.6 No impacts on badgers are envisaged as a result of the proposed Power Generation Plant. However passage across this area cannot be discounted and thus updated badger surveys would be required prior to construction of the Power Generation Plant to ascertain that the status of badgers in this area has not changed.

8.8.7 No semi-mature or mature trees, and thus roosting bats, are present within the area proposed for the Power Generation Plant. Impacts on roosting bats within trees are therefore negligible.

8.8.8 A full assessment, following completion of the bat activity surveys, will be made in the ES.

8.8.9 One pond (Pond 4) was found situated approximately 150m to the north of the Power Generation Plant footprint. Further ponds were present in the wider landscape, however; the presence of roads would provide effective barriers for dispersal of GCN in to the Power Generation Plant footprint from these locations.

8.8.10 Pond 4 is used by the chicken little fired Power Station as a fire hydrant and as such, is subject to varying water levels and/or drainage. It was

located within an area of amenity grassland with limited suitable terrestrial habitat available in the surrounding area.

8.8.11 Given its isolated nature, it was considered unlikely that GCN would be found present. However, as a result of an average HSI, it was not considered possible to entirely discount this pond without further survey. Further survey was not possible due to Health and safety constraints preventing access to the water along with a lack of visibility due to a covering of blanket weed. Taking into consideration its proximity to the Power Generation Plant footprint, it has been necessary to adopt a precautionary approach in this assessment under the assumption that GCN are present in Pond 4.

8.8.12 The positioning of the Power Generation Plant within an area of largely unsuitable habitat comprising arable land more than 100m distant from pond 4 is considered likely to result in low-negligible impacts upon GCN. With appropriate mitigation, including the exclusion of GCN from the construction footprint and the enhancement of habitat surrounding the pond any impacts are likely to be rendered as insignificant.

8.8.13 No impacts to Schedule 1 bird species are envisaged as a result of the proposed for the Power Generation Plant. No impacts to breeding birds are envisaged through careful design and avoidance of key areas and timing of the works however a full assessment will be required within the ES.

8.8.14 No impacts on reptiles within the area proposed for the Power Generation Plant are envisaged.

GAS CONNECTION ROUTE CORRIDOR OPTION 1

8.8.15 Impacts on internationally designated sites resulting from the construction of this Gas Connection Route Corridor Option are considered negligible.

8.8.16 No impacts on sites of national, regional or local importance are envisaged as a result of this Gas Connection Route Corridor Option.

8.8.17 Should Gas Connection Route Option 1 be taken forward following consultation, a full assessment would be made in the ES.

8.8.18 It should be noted that only those species for which potential impacts are present have been referenced are addressed below.

8.8.19 No impacts on badgers are envisaged as a result of the proposed Gas Connection Route. However, passage across the site, encompassing the proposed Gas Connection option cannot be discounted and thus

updated badger surveys would be required prior to construction of the Gas Connection, once the specific route and work footprint is known, to ascertain that the status of badgers in this area has not changed.

8.8.20 No semi-mature or mature trees, and thus roosting bats, are present within the area proposed for this Gas Connection option. Impacts on roosting bats therefore are negligible.

8.8.21 Should Gas Connection Route Option 1 be taken forward following consultation, full assessment, following completion of the bat activity surveys, will be made in the ES.

8.8.22 No ponds were found within 250m of Gas Connection Route Option 1, where there was connectivity to the works footprint, which were considered suitable for GCN. As such, impacts on GCN are not considered likely.

8.8.23 250m between pond locations and the working footprint is considered an appropriate distance for consideration due to the localised and temporary nature of works during construction and operation.

8.8.24 Assessment of pond suitability for GCN was based on a number of criteria, including the use of HSI. Ponds discounted from survey as a result of poor or below-average HSI scoring, will require reassessment prior to works commencing.

8.8.25 No impacts to Schedule 1 bird species are envisaged as a result of the proposed Gas Connection Route Option 1. No impacts to breeding birds are envisaged through careful design and avoidance of key areas and timing of the works However, a full assessment will be required within the ES should Gas Connection Route Option 1 be taken forward following consultation.

8.8.26 The impacts to grass snake are considered to be very low to negligible in the area proposed for the Gas Connection Route Option 1.

8.8.27 Should Gas Connection Route Option 1 be taken forward following consultation, a full assessment of potential impacts on grass snake will be made in the ES of this option.

GAS CONNECTION ROUTE CORRIDOR OPTION 2

8.8.28 As for Gas Connection Route Option 1, no impacts on statutory and non-statutory designated sites are envisaged for Gas Connection Route Option 2.

8.8.29 Should Gas Connection Route Option 2 be taken forward following consultation, a full assessment would be made in the ES.

8.8.30 It should be noted that only those species for which potential impacts are present have been referenced and addressed below.

8.8.31 No impacts on badgers are envisaged as a result of the proposed Gas Connection Route Option 2. However, passage across the site, encompassing the proposed Gas Connection option cannot be discounted and thus updated badger surveys would be required prior to construction of the Gas Connection, once the specific route and work footprint is known, to ascertain that the status of badgers in this area has not changed.

8.8.32 No semi-mature or mature trees, and thus roosting bats, are present within the area proposed for the Gas Connection Route Option 2. Impacts on roosting bats therefore are negligible.

8.8.33 Should Gas Connection Route Option 2 be taken forward following consultation, a full assessment, following completion of the bat activity surveys, will be made in the ES.

8.8.34 Four ponds considered suitable for GCN were found within 250m of Gas Connection Route 2 (Ponds 6, 7, 8 and 9). However, the presence of roads and significant areas of hardstanding provide barriers that would preclude dispersal of GCN to the footprint of Gas Connection Route Option 2.

8.8.35 No other ponds considered suitable for GCN were found within 250m of the footprint of Gas Connection Route 2 and as such, impacts on GCN are not considered likely.

8.8.36 250m between pond locations and the working footprint is considered an appropriate distance for consideration due to the localised and temporary nature of works during construction and operation. Assessment of pond suitability for GCN was based on a number of criteria, including the use of HSI. Ponds discounted from survey as a result of poor or below-average HSI scoring, will require reassessment prior to works commencing.

8.8.37 No impacts to Schedule 1 bird species are envisaged as a result of the proposed Gas Connection Route Option 2. No impacts to breeding birds are envisaged through careful design and avoidance of key areas and timing of the works. However, a full assessment will be required within the ES should Gas Connection Route Option 2 be taken forward following consultation.

8.8.38 The impacts to grass snake are considered to be very low to negligible in the area proposed for the Gas Connection Route Option 2.

8.8.39 Should Gas Connection Route Option 1 be taken forward following consultation, a full assessment of potential impacts on grass snake will be made in the ES.

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 1

8.8.40 Impacts on internationally designated sites resulting from the construction of the Electrical Connection and Compound 1 are considered negligible.

8.8.41 No direct impacts on sites of national, regional or local importance are envisaged as a result of the Electrical Connection and Compound 1.

8.8.42 Should Electrical Connection and Compound 1 be taken forward following consultation, a full assessment would be made in the ES.

8.8.43 It should be noted that only those species for which potential impacts are present have been referenced and addressed below.

8.8.44 No impacts on badgers are envisaged as a result of the proposed Electrical Connection and Compound 1. However, passage across the site, encompassing this proposed Electrical Connection and Compound option cannot be discounted and thus updated badger surveys would be required prior to construction of Electrical Connection and Compound 1, once the specific route and work footprint is known, to ascertain that the status of badgers in this area has not changed.

8.8.45 Impacts to roosting bats are not envisaged within the area proposed for Electrical Connection and Compound 1 unless the six trees noted with potential for bat roosts cannot be purposefully avoided, particularly any trees which are of the highest potential (Category 1 or above) for roosting bats.

8.8.46 Should Electrical Connection and Compound 1 be taken forward following consultation, a full assessment will be made in the ES. Further surveys would be required if avoidance is not possible and if any bat roosts were present, appropriate mitigation devised.

8.8.47 It should be noted that as bats are transient there may be a requirement to conduct additional inspections of those trees with bat potential, depending on the time that passes between now and the construction of the Electrical Connection and Compound 1 to ensure no indirect impacts. For example indirect impacts on bats may arise from lighting associated with the sub-station.

8.8.48 Should Electrical Connection and Compound 1 be taken forward following consultation, a full assessment will be made in the ES once the activity surveys have been completed.

8.8.49 Three ponds (Ponds 12, 13 and 14) considered suitable for GCN were found within the footprint of Electrical Connection and Compound 1. GCN were found likely to be absent from these ponds during presence/absence surveys carried out in May and June 2013.

8.8.50 In addition, one ditch (15) and a number of ponds (ELF, A140, M2, 30M, M3 and 32M) considered suitable for GCN were found within 250m of the footprint. These were not surveyed as part of the assessment as a result of access restrictions and/or health and safety concerns. Should the footprint of the Electrical Connection and Compound 1 be sited to avoid the 250m area surrounding these waterbodies, impacts on GCN are not considered likely. Further consideration of these waterbodies through survey would be necessary should it not be possible to avoid the 250m radii around the above-mentioned ponds.

8.8.51 250m is considered an appropriate distance for consideration in this assessment due to the localised and temporary nature of works during construction and operation. Assessment of suitability was based on a number of criteria, including the use of HSI. Ponds discounted from survey as a result of poor or below-average HSI scoring will require reassessment prior to works commencing.

8.8.52 No impacts to Schedule 1 bird species are envisaged as a result of the proposed Electrical Connection and Compound 1. No impacts to breeding birds are envisaged through careful design and avoidance of key areas and timing of the works. However, a full assessment will be required within the ES should Electrical Connection and Compound 1 be taken forward following consultation.

8.8.53 Impacts to grass snake in the area proposed for the Electrical Connection and Compound 1 are considered to be very low.

8.8.54 Should Electrical Connection and Compound 1 be taken forward following consultation, a full assessment of potential impacts on grass snake will be made in the ES.

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 2

8.8.55 As for the Electrical Connection Route and Compound 1, no impacts on statutory and non-statutory designated sites are envisaged for the Electrical Connection route and Compound 2.

8.8.56 Should Electrical Connection and Compound 2 be taken forward following consultation, a full assessment would be made in the ES.

8.8.57 No impacts on badgers are envisaged as a result of the proposed Electrical Connection and Compound 2. However, passage across the site, encompassing this proposed Electrical Connection and Compound option cannot be discounted and thus updated badger surveys would be required prior to construction of Electrical Connection and Compound 2, once the specific route and work footprint is known, to ascertain that the status of badgers in this area has not changed.

8.8.58 Impacts to roosting bats are not envisaged within the area proposed for Electrical Connection and Compound 2 unless the six trees noted with potential for bat roosts cannot be purposefully avoided, particularly any trees which are of the highest potential (Category 1 or above) for roosting bats.

8.8.59 Should Electrical Connection and Compound 2 be taken forward following consultation, a full assessment will be made in the ES. Further surveys would be required if avoidance is not possible and if any bat roosts were present, appropriate mitigation devised.

8.8.60 It should be noted that as bats are transient there may be a requirement to conduct additional inspections of those trees with bat potential, depending on the time that passes between now and the construction of the Electrical Connection and Compound 2 to ensure no indirect impacts. For example indirect impacts on bats may arise from lighting associated with the sub-station.

8.8.61 Should Electrical Connection and Compound 2 be taken forward following consultation, a full assessment will be made in the ES.

8.8.62 One pond (Pond 11) considered suitable for GCN was found within the footprint of Electrical Connection and Compound 2. GCN were found likely to be absent from this pond during presence/absence surveys carried out in May and June 2013.

8.8.63 In addition, one ditch (M2) and one pond (20M) considered suitable for GCN were found within 250m of the footprint of Electrical Connection and Compound 2. These were not surveyed as part of this assessment as a result of access restrictions and/or health and safety concerns. Should the footprint of the Electrical Connection and Compound 2 be sited to avoid the 250m area surrounding these waterbodies, impacts on GCN are not considered likely. Further consideration of these waterbodies through survey would be necessary should it not be possible to avoid the 250m radii around the above-mentioned pond and ditch.

8.8.64 250m is considered an appropriate distance for consideration in this assessment due to the localised and temporary nature of works during construction and operation. Assessment of suitability was based on a number of criteria, including the use of HSI. Ponds discounted from survey as a result of poor or below-average HSI scoring will require reassessment prior to works commencing.

8.8.65 No impacts to Schedule 1 bird species are envisaged as a result of the proposed Electrical Connection and Compound 2. No impacts to breeding birds are envisaged through careful design and avoidance of key areas and timing of the works. However, a full assessment will be required within the ES should Electrical Connection and Compound 2 be taken forward following consultation.

8.8.66 Impacts to grass snake in the area proposed for the Electrical Connection and Compound 2 are considered to be very low.

8.8.67 Should Electrical Connection and Compound 2 be taken forward following consultation, a full assessment of potential impacts on grass snake will be made in the ES .

8.9 Potential Mitigation / Management Techniques

8.9.1 Any required ecological mitigation measures will be designed accordingly once the exact location of the Gas Connection, Electrical Connection and Electrical Connection Compound are known and full impacts have been assessed within the ES.

8.10 Preliminary Assessment of Residual Effects

8.10.1 On the basis of the preliminary environmental information and assessment described above, likely significant effects cannot yet be been ruled out entirely while ecological surveys are still ongoing and the route corridors for the Electrical Connection and Electrical Connection Compound Areas are still under consideration.

8.11 Next Steps

8.11.1 Following the completion of all of the Phase 2 species surveys, a full assessment of the potential impacts of the proposed Project on ecology will be undertaken. This assessment will enable the proposed Project team to identify areas of potential risk and design mitigation measures to reduce ecological risks to within acceptable limits where necessary.

8.11.2 Following a decision on which options will be taken forward in respect of the Gas Connection, Electrical Connection and Electrical Connection

Compound,, it will also be possible to consider opportunities of potential ecological enhancement.

SECTION 9

WATER QUALITY AND RESOURCES

9 WATER QUALITY AND RESOURCES

9.1 Introduction

9.1.1 During construction, operation and decommissioning there is some potential for elements of the proposed Project to impact on local water quality. However, this potential is relatively limited as there will be minimal water usage requirements on site by the Power Generation Plant, particularly during operation as the Power Generation Plant will operate as a SCGT with air cooling. Neither the Gas Connection, Electrical Connection nor the Electrical Connection Compound will require any water. Both water quality and water usage will be assessed in this section, with the full assessment being carried out within the EIA and reported on in the ES to be submitted with the proposed DCO Application.

9.1.2 This section will also provide a brief summary of the main issues and risks posed to and from flooding. However, these will be assessed in detail through a separate Flood Risk Assessment (FRA) submitted as a separate document as part of the proposed DCO Application.

9.2 Legislative and Policy Context

Water Framework Directive

9.2.2 EU Directive 2000/60/EC established a framework for Community action in the field of water policy (the Water Framework Directive (WFD)). The overarching goal of the WFD is for relevant waters to reach "good" chemical and ecological status by 2015. Member states then have to maintain this standard. Provided that certain conditions are satisfied, in some cases the achievement of good status may be delayed until 2021 or 2027.

9.2.3 The WFD also sets goals for the progressive reduction of emissions, discharges and losses of Priority Substances and the cessation of Priority Hazardous Substances. As part of the WFD's aim to improve water quality by reducing specific Priority Substances, the first priority substances list (Decision 2455/2001/EC) was issued by the European Commission identifying 33 priority substances.

9.2.4 The Priority Substances Directive, a daughter directive of the WFD was introduced in 2008 and it replaced the first priority substances list. In 2012, the European Commission put forward a proposal for a directive amending the WFD and the Priority Substances Directive regarding Priority Substances. In July 2013, the European Parliament adopted a legislative resolution on the proposal. As such, a new Directive may emerge but is not currently in force.

9.2.5 In the UK, a technical advisory group (WFDTAG) consisting of the UK environment and conservation agencies has been established to support the implementation of the WFD. The WFDTAG has established standards for certain substances that they consider are concentrations of a pollutant below which no harmful effects on aquatic organisms would be expected.

National Policy Statements

9.2.6 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic water quality and resources impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

9.2.7 NPS EN-1 states, in Section 5.15, that “Infrastructure development can have adverse effects on the water environment including groundwater, inland surface water, transitional waters and coastal waters.” An assessment of the existing conditions regarding water quality, water resources and physical characteristics of the water environment and the impacts of a proposed Project is required by paragraph 5.15.2.

9.2.8 EN-1 notes that activities that discharge to the water environment are subject to additional pollution controls and recommends that the Secretary of State (SoS) gives increased weight to impacts on the water environment that would have an adverse affect on the achievement of the objectives of the WFD in its decision making. Paragraph 5.15.7 states that: “The [Secretary of State] should consider whether appropriate requirements should be attached to any development consent ... to mitigate adverse effects on the water environment.”

9.2.9 EN-2 Part 2 Section 2.10 states that ‘Water quality and resource’ recognises that some fossil fuel generating stations such as coal-fired stations and CCGTs have very high water demands, whilst others such as open cycle gas turbines (OCGTs) have very little water demand, Paragraph 2.2.9 therefore states the following: “The applicant should have investigated the availability of such supply at an early stage.”

9.2.10 EN-4 Part 2 Section 2.22 recognises that “constructing pipelines creates corridors of surface clearance and excavation that can potentially affect watercourses, aquifers, water abstraction and

discharge points, areas prone to flooding and ecological receptors. Pipeline impacts could include inadequate or excessive drainage, interference with groundwater flow pathways, mobilisation of contaminants already in the ground, the introduction of new pollutants, flooding, disturbance to water ecology, pollution due to silt from construction and disturbance to species and their habitats".

9.2.11 EN-4 states that where the project is likely to have effects on water resources or water quality an assessment of the impacts should be provided in line with Section 5.15 as part of the ES. The SoS should be satisfied that the impacts on water quality and resources are acceptable in accordance with Section 5.15 of EN-1.

Environmental Permitting Regulations 2010

9.2.12 The Environmental Permitting (England and Wales) Regulations 2007 sought to establish an integrated approach to Waste Management Licensing and Pollution Prevention and Control. In April 2010, the Environmental Permitting (England and Wales) Regulations 2010 increased the scope of the Environmental Permit to include water discharges and groundwater activities. The EA will control and regulate the proposed Project with respect to the discharge of any effluent from the site via an Environmental Permit. The permit will include specific limits for a range of pollutants that could be present in any effluent proposed to be discharged to surface waters. These limits will be set to ensure that the process contribution of any pollutant within the scope of the WFD and the EQS Directive does not detrimentally affect the potential for the receiving water body to achieve good status.

Other National and Local Policy

9.2.13 Whilst the PA 2008 is clear as to the primacy of the relevant NPS, other national and local planning policy can be considered important and relevant by the SoS in the determination of an energy NSIP.

9.2.14 At paragraph 109, the NPPF that the planning system should contribute to and enhance the natural environment by: "preventing new development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of...water...pollution."

9.2.15 The NPPF states (paragraph 7) that the planning system should perform a number of roles in delivering sustainable development including an environmental role "contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently,

minimise waste and pollution and mitigate and adapt to climate change including moving to a low carbon economy."

9.2.16 The Core Strategy of the Mid Suffolk Local Development Framework (LDF) aims to set out the vision, objectives, spatial strategy and core policies that will guide development across the district until 2025 and beyond. The Core Strategy has 15 Core Objectives; the most relevant to this chapter is as follows: Core Strategy Objective 2 "to seek to improve water quality and reduce pollution to the wider environment."

9.2.17 Policy aims relating to water quality and water resources within the Core Strategy and the saved policies of the Mid Suffolk Local Plan will be discussed in the final ES chapter and the separate Planning Statement that will be prepared to accompany the proposed DCO Application.

9.3 Project Scenario for Assessment

9.3.1 In respect of potential impacts on water quality and resources, the realistic worst case scenario from within the proposed Project parameters (described in Section 3 of the PEIR) are set out in Table Table 9.1

Table 9.1- Realistic Worst Case Scenario for Assessment of Water Quality Impacts

Parameters	Details
Number of gas turbine units	5 (~ 59 MW)
Number of stacks	5
Unit type	Aero derivative

9.3.2 A larger number of smaller Gas Turbine Generator units is considered to be the worst case scenario for water resources at the Project Site. To generate the same power output as a larger 299 MW unit at the Project Site the water requirement will be marginally higher for five separate units as there are five separate plant items for NOx abatement. There is also the requirement for marginally more water to wash turbine blades of five separate units rather than washing blades of a lower number of units.

9.3.3 A preliminary assessment of both options for the Gas Connection, Electrical Connection and Electrical Connection Compound is presented in this section.

9.4 Assessment Methodology and Significance Criteria

Water Resources

9.4.2 The preliminary assessment of water resources covers all major water use activities for the proposed Project. The sources of raw water will be identified and the appropriate processing and storage methods are defined, based on the intended uses. The reason for use and the amounts of water required will be specified and, where appropriate, the anticipated effluent compositions established. The fate and impact of all effluents will be assessed.

Water Quality

9.4.3 The EA Horizontal Guidance Note H1 – Annex (d): Surface Water Discharges (basic) and Horizontal Guidance Note H1 – Annex (e): Surface Water Discharges (complex) outline methodologies for the quantification of the impacts of discharges to surface waters where the concentrations of the various parameters within the effluents are known.

9.4.4 The EA Horizontal Guidance Note H1 – Annex (d) details the target ambient river quality benchmarks for a range of pollutants, of which those most relevant to the proposed Project are summarised in Table 9.2

Table 9.2 - Environmental Quality Standards (µg/l)

Parameter	Comments	Short-Term Maximum Allowable Concentration (µg/l)	Long-Term (Annual) Average Concentration (µg/l)
Priority Substances			
Cadmium	and its compounds	1.5	0.2
Mercury	and its compounds	0.07	0.05
Lead	and its compounds		7.2
Nickel	and its compounds		20
Specific Pollutants			
Cyanide, (as CN-)	Standards for HCN only	5	1
Chlorine	Total residual Oxidants (TRO)	10	
Arsenic	Dissolved		25
Chromium	(VI) – Dissolved	32	0.6
Copper	Dissolved		5
Zinc	Dissolved		40
Iron	Dissolved		1000
Physico-Chemical Standards			
Ammonia (as NH4-)	Total ammonia as Nitrogen	300	
N-Total	Dissolved inorganic nitrogen (µ mol/l)		30
EA Non-Statutory EQS			
Hydrogen Sulphide	-	10	
Fluoride	-	15000	5000

9.4.5 This section also presents high level discussions of the likely mitigation measures to be employed as the exact nature of all effluents, including drainage systems, will be finalised during the further EIA and design phase of the proposed Project. The proposed Project will be engineered to adhere to the standards and limits for effluent discharge as prescribed in the Environmental Permit.

Significance Criteria

9.4.6 The significance criteria of the potential/likely impacts of the proposed Project on water quality are defined in Table 9.3. These criteria are based on guidance for the assessment of the impacts of discharges to surface waters as outlined in the EA Horizontal Guidance Note H1 – Annex (d).

Table 9.3 - Significance Criteria for Individual Pollutants

Significance	Short-Term Criteria	Long-Term Process Contribution	
	Process Contribution as a percentage of Maximum Allowable Concentration	Process Contribution as a percentage of relevant EQS	Predicted Environmental Concentration as percentage of relevant EQS
Not significant	< 100%	< 1%	-
Minor	< 100%	> 1%	< 70%
Moderate	< 100%	> 1%	70% < x < 100%
Major	> 100%	-	-
Severe	-	> 1%	> 100%

9.5 Embedded Design Mitigation

9.5.1 The proposed Project has been designed from the outset to ensure its impacts are minimised. This includes mitigation that is embedded into the design of the Power Generation Plant, Gas Connection, Electrical Connection and Electrical Connection Compound and industry standard methods and procedures to ensure impacts from construction, operation and decommissioning are minimised. In respect of Water this mitigation includes:

- Choice of SCGT technology which does not require a large amount of water for its operation; and
- Use of industry best practices in design and construction of water course crossings (e.g. Horizontal Directional Drilling) to reduce interaction with watercourses.

9.5.2 The assessment in this section takes such design mitigation into account. Any additional mitigation developed in response to specific impacts identified in this assessment is described in Section 9.9] below.

9.6 Consultation

9.6.1 Table 9.4 below presents the consultation responses that have been received following submission of the Progress Power Scoping Report. The table provides details of the comments relating to the Water Resources element of the EIA and a brief description of how each comment has been addressed.

Table 9.4 – Scoping Consultation

Reference	Comment	Actions
PLANNING INSPECTORATE		
3.36	The SoS welcomes the assessment of the potential impacts resulting from the development of the Power Generation Plant on local water quality and flooding. The ES should identify and clearly map any surface water resources (including springs and private water supplies both internal and external to the site boundary) that could potentially affect or be affected by the proposal.	Surface water resources are recorded on Figure 9.1.
3.37	Potential sources of pollution should be identified, as well as pathways to potential hydrological and surface water receptors, this includes the aquifer below the site.	These are identified in Section 9.7 Baseline and presented in the site Conceptual Site Model.
3.38	Full details on the rates of potable use at each stage should be assessed.	Potable water will dominate water demand on-site during operation. Exact quantities will be provided in the ES.
3.39	Potential impacts on the public sewer network should be assessed, including easements and any potential impacts arising from vibration during the construction works. The SoS recommends consultation with relevant organisations (including water and sewerage companies) to agree the approach.	Based on maps provided, there is currently no local sewage network on-site, and sewage will be sent to an onsite septic tank. Therefore we don't expect there to be any impact on the public sewer network.
3.40	Mitigation measures should be addressed and the SoS advises that reference should be made to other regimes (such as pollution prevention from the EA). On-going monitoring should also be addressed and agreed with the relevant authorities to ensure that any mitigation measures are effective.	The need for mitigation measures will be established through the assessment process. At this stage it is not envisaged that the proposed Project will have any significant

		impact on water quality, water courses or local aquifers.
3.41	The SoS welcomes the commitment to provide a Flood Risk Assessment (FRA) in accordance with the Applications Prescribed Forms and Procedures Regulations (APFP). The FRA should cover ground water, surface water and fluvial impacts. The SoS recommends that a Surface Water Management Plan should be prepared which may include a review of existing drainage facilities and the provision of interceptors on site.	A separate FRA is being conducted as part of the proposed Project, the scope of which is currently being finalised with the Environment Agency.
3.42	The FRA should form an appendix to the ES. The SoS recommends that the sections considering the water environment should be cross referenced.	A separate FRA will form an Appendix to the ES. The ES section will reference the FRA and vice versa, as appropriate.
SCC		
Water Resources 68	The Scoping Report does not reflect that the site is located in an extremely water stressed area. Essex and Suffolk Water's draft Water Resource Management Plan states "[T]he Essex and Suffolk supply areas are located within some of the driest areas of the country and as such face particular challenges including a general lack of new intrinsic water resources, growing demand, and uncertainty for climate change".	Noted – the Power Generation Plant will be designed in a manner that limits water requirements during operation. Water requirements during constriction are detailed in section 9.8 potential impacts. Water that is required will be delivered to the Power Generation Site by tanker to eliminate the need for abstraction from groundwater or watercourses. It is likely that water will be tankered to site during construction, operation and decommissioning. An alternative option of using potable water from the town supply will be assessed in the

		ES.
69	Eye is located within Essex and Suffolk Water's Suffolk Hartismere Water Resource Zone, which histroically has been the most affected by drought of all the WRZz (page 252)	Noted – see above
70	It is recognised that water companies are under no obligation to suply new industrial users, but there is localised concern over the implications of the water requirements of the Project (which are not set out in the Scoping Report, though it is assumed the plant will utilise air cooling (5.6.3)) for existing particularly agricultral users.	Water use at the Power Generation Plant will be limited to mainly domestic/sanitation purposes only during operation and to sanitation and wheel washing during construction / decommissioning. Therefore water use will be minimal.
71	Consequently the ES should set out more clearly the water requirements of the plant in operation (but also construction), where it proposes to source water from and in what quantities and how it will make it available on site and also, similarly, how waste water will be disposed of (for example via tankering).	Noted. Some of this information has been presented in the PEIR and the remainder will be set out in the ES.
72	The ES should also set out the opportunities for rainwater harvesting of the plant in operation (but also construction), where it proposes to source water from and in what quantities and how it will make it available on site and also, similarly, how waste water will be disposed of (for example via tankering).	All water required on-site for the Power Generation Plant during operation is anticipated to be tankered to site and stored in water storage tanks adjacent to the administration buildings. It is possible that rainwater harvesting could be used for admin facilities (e.g. toilets). Quantities of water usage and disposal during construction, operation and decommissioning will be clearly stated in the ES.

73	Sustainable Drainage Systems (5.6.19) should be deployed to maintain a greenfield runoff rate for the site and designed to be integrated in to a wider network in due course to ensure efficient use of space on the airfield. If well-designed, SUDS can have ancillary environmental benefits, for example through creation of new habitat.	At present it is still being investigated whether sustainable drainage systems (SUDS) are a suitable drainage method for the Power Generation Site.
74	The applicant should be aware that Schedule 3 of the Flood and Water Management Act 2010 is proposed to commence by April 2014. This will require the applicant to obtain drainage approval for any works affecting surface water and is in addition to planning consent. It will be an offence to construct without drainage approval. If, however development consent is granted before this time, them no drainage approval would be required.	Noted – It has been agreed with the EA that the EIA will provide enough detail to illustrate that excess surface water can be effectively dealt with on site, and that a detailed drainage system design will be provided to the Lead Local Flood Authority (LLFA) for approval prior to construction.
MSDC		
Water Resources	As indicated in the response provided by SCC the site is located within an extremely water stressed area. The ES should therefore clearly set out the possible water requirements during the construction and operational phases of the development.	A provisional assessment of water requirements is provided in this chapter and further details will be provided in the ES.
	The Scoping report identifies five surface water bodies within the vicinity of the proposed plant however there are known to be more. The applicant should therefore be encouraged to undertake a more extensive survey.	Noted. All waterbodies in the vicinity of the Project Site are shown in Figure 9.1
	The ES should set out the opportunities available to manage surface water drainage as a means of mitigation, including the use of Sustainable Drainage Systems.	The methods for managing surface water have been discussed with the Environment Agency and will be presented in the FRA that accompanies the ES.

NORFOLK COUNTY COUNCIL		
Derek Sim Email 16th June 2013 16:18	... from a fire service view point the proposal looks okay my concern lies in the fact it does not seem to have made provisions for any private hydrants or EWS. I know that the airfield itself is now heavily commercialised both next to the A140 and from the Langton Green side (Mid Suffolk Business Park) and the water of some description must reach all of the units.	An attenuation pond will be on-site and this could be dual purpose as an Emergency Water Supply if needed.
	The proposal is next to the existing power station run by EBR they have both EWS and suppression systems within the building. I would make an assumption that some sort of suppression system will be included in the design and run off will be held on site as part of the environmental impact assessment but no sign of any dedicated water supply for fire fighting. There may be a supply through the Humphrey's development next to the A140 which could be connected too, or a dedicated one put in from either Castleton Road end or from Mid Suffolk Business park however a site of this size I suggest would need to have its own dedicated EWS.	There will be fire water tanks present on-site during operation. We have discussed with the Environment Agency and they have stated that we do not need to take into account increase in surface water runoff as a result of the actions of the fire service. Although a Fire Water plan will need to be submitted to prevent pollution from Fire Water.
	16 ditches and ponds have been identified within 500 m of the proposed site 8 within 250 m which are either average or below, the construction of a new EWS could be used for our purpose and decrease the environmental impact by providing a habitat for wildlife if built sympathetically, with access for Fire Service. The proposed site is in Suffolk so they ultimately will have their say but just my observations.	Outline plans include provisions for an attenuation pond which will be used to control the increase in surface water runoff from the Power Generation Plant site during operation resulting from the increase in hard standing. This could have a dual purpose and could be used during emergencies if required. Consultation is ongoing regarding

		the provision of additional habitat mitigation on the Project Site.
ESSEX AND SUFFOLK WATER		
Email dated 19th June 2013 11:30	We have no objection to the proposed development. We give our consent to the development on the condition that new water connection is made onto our company network for the power station, for revenue purposes.	The exact design is not finalised and the decision of whether to tanker in water or have a mains water supply has not yet been made.
	We assume that the existing water mains in the vicinity will be sufficient to supply the proposed power station with an adequate water supply. We note that in the Parsons Brinckerhoff Report Paragraph 3.3.28 is states that, '...the total plant water requirement is negligible.' If the water network requires reinforcement to enable Essex & Suffolk to supply sufficient quantity of water for the operation of the power station, then the cost of these works will be charged to the Client.	Based on maps provided by Essex and Suffolk Water the closest mains water supply is provided to the Chicken Litter Power Station to the north of the Power Generation Plant.
	Please note, Essex & Suffolk Water are the enforcement agents for The Water Supply (Water Fittings) Regulations 1999 within our area of supply, on behalf of the Department for the Environment, Food & Rural Affairs. On completion of the power station, and before a water supply is provided, Essex & Suffolk Water should be contacted as the premises are Modifiable under Regulation 5 of the Water Supply (Water Fittings) regulations 1999. Please see the copy of the Water Regulations Information Sheet No. IS-0014 attached for more detailed information.	Noted.
ENVIRONMENT AGENCY		
Flood risk – Surface Water	Our most recent modelled data indicates that the site lies within Flood Zone 1, and is therefore at low risk of flooding from fluvial or tidal sources (i.e. a less than 0.1% annual probability of flooding).	A separate FRA is being conducted as part of the proposed DCO Application and Progress Power is

Drainage	The modelled flood outlines show areas of potential flooding as a direct result of floodwater coming from a watercourse and no direct effects of surface runoff or surface flooding are included. As such, any planning application for a site greater than 1 hectare in area will need to be supported by an appropriate site specific Flood Risk Assessment (FRA).	working with the EA to agree a scope.
	The FRA will need to assess the flood risks to the development site, and demonstrate how the building and any occupants will be kept safe from flooding, now, and over the lifetime of the development and not increase flood risk elsewhere as a result of any additional impermeable surfaces.	Noted
	Within the FRA, allowances for climate change should be considered within the design of the surface water drainage scheme. The allowance should be applied as detailed in the Technical Guidance to the National Planning Policy Framework (NPPF), for the lifetime of the proposed development, including allowances for climate change.	Noted
	The development of this site should look to incorporate sustainable drainage systems (SUDS) to manage surface water in accordance with paragraph 103 of the NPPF and MSDC's Strategic Flood Risk Assessment (SFRA). There is the opportunity to incorporate a range of SUDS features due to the scale of the development site.	An assessment of whether SUDs is suitable for the site will be included in the FRA, but the detailed design of any such system will be carried out during the detailed design stage of the project following submission of the proposed DCO application.
Flood risk to the Proposed Development	The FRA submitted with the proposed application must comply with the requirements set out in paragraph 9 of the Technical Guide to the NPPF. The submitted FRA should provide a suitable basis for assessment to be made of the flood risks arising from the proposed development. In particular, the submitted FRA	Noted.

Site	should demonstrate that an adequate surface water management strategy will be adopted. With regards to surface water management, the FRA should provide:	
	confirmation that any runoff from the developed site shall not exceed the existing Greenfield runoff rates for a range of equivalent return period rainfall events over the lifetime of the development.	A surface water drainage system will be implemented and this will prevent runoff rates exceeding the existing Greenfield rates.
	Calculations to demonstrate that the proposed surface water management scheme has been adequately sized to accommodate the critical duration 1 in 100 year rainfall event including allowances for climate change without causing nuisance or damage. The management strategy should consider both storage and conveyance f surface water.	This will be included within the standalone FRA.
	Plans and drawings showing the locations and dimensions of all aspects of the proposed surface water management scheme. The submitted plans should demonstrate that the proposed drainage layout will perform as intended based on the topography of the site and the location of the proposed surface water management features. In addition, full design details, including cross-sections of any proposed infiltration or design features will be required.	More detailed plans will be included within the final ES chapter. However, the drainage system will only be finalised during detailed design of the plant and when a suitable plant supplier has been selected.
	Confirmation that in the event of exceedance flows that surpass the critical duration rainfall event or a blockage/failure occurs within the drainage network any proposed features should incorporate an emergency spillway as part of their design. We suggest that the emergency spillway directs any exceedance flow away from the development.	This will be included within the standalone FRA.
	Sufficient information to demonstrate that people and property will be kept safe from flooding, with consideration given to overland	This will be included within the standalone FRA.

	flow routing where required.	
	Details of the future adoption and maintenance of all aspects of the surface water drainage strategy. The local planning authority should be satisfied that arrangements are in place for the long term maintenance and management of the surface water management scheme.	This will be included within the standalone FRA.
	Information to demonstrate that priority is given to the use of sustainable drainage systems (SUDS) for the disposal of surface water from all elements of the development proposal. Therefore, the scheme shall incorporate the SUDS “Management Train” and ensure all features are designed in accordance with CIRIA (C697) The SUDS Manual so ecological, water quality and aesthetic benefits can be achieved in addition to the flood risk management benefits. In surface water drainage system should be formulated as per the recommendations within the CIRIA SUDS Manual (C697).	This will be included within the standalone FRA.
	Evidence to establish if the principles of any infiltration based surface water drainage strategy are achievable on site based on the ground conditions. The FRA should provide evidence that the ground conditions are suitable for the proposed methods, such as infiltration or soakaway tests which adhere to BRE365 guidance.	This will be included within the standalone FRA.
Reason	To prevent the increased risk of flooding, to improve and protect water quality, improve habitat and amenity, and ensure future maintenance of the surface water drainage system.	-
Additional advice to the applicant	Erection or replacement of flow control structures or any culverting of an ordinary watercourse requires consent from the relevant Lead Local Flood Authority (SCC). It is best to discuss proposals for any works with them at an early stage.	It is not envisaged at this stage that these measures will be required. However, if crossings are required following the refinement of the Electrical Connection or Electrical

		Connection Compound , further consultations will be carried out.
	We would suggest that, given the mapped presence of an aquifer at the site further groundwater investigation takes place in order to clarify any potential risk. In the event a high groundwater table occurs, the cumulative effect of surface water that is impeded from draining and an elevated groundwater table could pose an unacceptable flood risk to the development or impact the design of attenuation or infiltration features.	The underlying aquifer is located at a significant depth below the overlying, hydraulically passive, superficial deposits, so the risk of any interaction is considered very low. However, this risk of groundwater flooding will be fully investigated in the FRA which will accompany the ES.
	There are a number of valley features within the red line boundary which may act as surface water flow routes. The layout of the proposed development should follow the “sequential approach” detailed in paragraph 6.7 of the PPS25 Practise Guide so as to ensure that sensitive parts of the development avoid any potential flood risk.	This will be covered in detail in the FRA.
Water Quality	Paragraph 5.6.4 of the Scoping Report refers to small quantities of water (blowdown) from the Power Generation Plant being discharged to avoid the build-up of impurities in the HRSG steam/water cycle. It is not clear from this description whether this discharge will be to the existing sewerage system or to local watercourses.	The design of the Power Generation Plant has been refined since the scoping stage. The plant will be an SCGT and therefore will not require a HRSG. Therefore very little process water will be required and it is not intended to discharge any process water from the Power Generation Site.
	The Environmental Statement (ES) should clarify the nature and location of the discharge, and if it is proposed that the discharge would be to a local watercourse the ES should:	As above.

	Set out the volumes of water likely to be discharged The constituents, including concentrations Potential impacts arising from the discharge on the water environment, including implications for Water Framework Directive (including Habitats Directive) compliance.	
	In addition, it is advisable that the applicant initiates pre-application discussions with us early on the process so that the discharge requirements can be discussed and agreement reached at an early stage ahead of the submission of the Development Consent Order application.	As above
	Consideration of the potential for a Water Framework Directive (WFD) Report/Assessment is discussed – see paragraph 5.6.21 – under the heading of water resources. There is also the potential for a WFD Report to be required in relation to water quality. We can advise the developer further on this area once the impact assessment work is underway and there is certainty on the degree of impacts on water quality receptors.	Noted
Water Resources	Consideration of the potential for a Water Framework Directive Report/Assessment in paragraph 5.6.21 is very much welcomed. We can advise the developer further on this area once the impact assessment work is underway and there is certainty on the degree of impacts on water resource receptors.	Further consultation will be held with the EA to determine whether a WFD Report is required for the Project Site.
	Paragraph 5.6.3: It should be noted that there is no water available in this catchment for abstraction should air cooling become unviable. From attendance by us at the meeting held with the developer and the local and county planning authorities on 16 May 2013 and the Scoping Report, it is evident that water will be tankered in from an external source which would be acceptable.	Noted. Air cooling is the preferred cooling method for the Power Generation Plant and at present there is nothing which suggests that this is not a feasible method of cooling the plant.

	Paragraph 5.6.34: 'It is possible that an underground electrical cable route may need to cross a water body, various crossing techniques will also be considered. These may include horizontal directional drilling, particularly for larger water bodies, or temporary bunding and over-pumping where flows are lower'. If this is the case then the appropriate licensing must be sought for temporary works and a WFD assessment must be carried out for the affected waterbod(ies).	All crossing methodologies will be assessed within the full ES once the Electrical Connection and Electrical Connection Compound option has been decided upon . At which time, all appropriate licences and the need for a WFD assessment will be considered.
EYE TOWN COUNCIL		
Water Resources	How many tanker movements are involved? What effect will they have on existing A140 traffic volumes? What investigations for on-site water extraction are planned, particularly in view of the scarcity of groundwater in the area? There is also a need for a careful planning of surface water treatment/run off particularly with the existing run-off problems effecting Eye.	It is not known at this stage how many tanker movements will be involved, this will be confirmed upon completion of the full EIA. The effects on traffic volumes on the A140 will be assessed within the Traffic and Infrastructure chapter of the ES. No investigations for on-site water extraction are planned; all water will be brought to site via tanker. Runoff rates will not exceed existing Greenfield rates currently at the Power Generation Plant site.
YAXLEY PARISH COUNCIL AND THRANDESTON PARISH COUNCIL		
4. Water Resources	In its description of watercourses in the area, the scoping report fails to mention several relatively minor ones to the west that feed into Stuston Beck and Thrandeston Beck. Any impact from the development on these watercourses should be assessed.	Noted, although no impact on these watercourses is anticipated. Watercourses in the area are detailed in Section 9.7 Baseline

		below.
	Some surface water drainage from the proposed site runs westwards under the A140 and eventually feeds into a watercourse west of the Yaxley Allotment. There is a risk of flooding the field at times of high run-off. The capacity of this system to take any more water should be investigated.	This will be assessed with the standalone FRA. Runoff rates will not exceed existing Greenfield rates currently at the Power Generation Plant site.

9.7 Baseline Conditions and Receptors

POWER GENERATION PLANT

Surface Water Bodies

9.7.2 Surface water bodies in the vicinity of the proposed Project will be identified and described in this section along with their importance. Based on an initial, high level assessment, the main water bodies are considered to be:

- Three ponds located next to Parke's Farm approximately 1.5 km north east of the Power Generation Plant site boundary;
- Two ponds located north at approximately 2.5 km north of the Power Generation Plant site boundary;
- One reservoir located at approximately 770 m east of the Power Generation Plant site boundary;
- One pond located at approximately 525 m west of the Power Generation Plant site boundary; and
- One small drain or watercourse approximately 750 m south west of the Power Generation Plant site boundary.

9.7.3 A more detailed assessment of surface water bodies will be carried out in the EIA, where a site visit will be conducted to each of the identified waterbodies.

9.7.4 The proposed Project falls within a Nitrate Vulnerable Zone (NVZ) and a Groundwater Source Protection Zone (GSPZ) III. The EA describes GSPZs as zones that "show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk" and notes that it uses GSPZs "in conjunction with our Groundwater Protection Policy to set up pollution prevention measures in areas which are at a higher risk, and to monitor the activities of potential polluters nearby"."

9.7.5 GSPZ IIIs are defined as "the area around a source within which all groundwater recharge is presumed to be discharged at the source. In confined aquifers, the source catchment may be displaced some distance from the source. For heavily exploited aquifers, the final Source Catchment Protection Zone can be defined as the whole aquifer recharge area where the ratio of groundwater abstraction to aquifer recharge (average recharge multiplied by outcrop area) is >0.75. There is still the need to define individual source protection areas to assist operators in catchment management. "

9.7.6 An Envirocheck report ordered for the proposed Project (see Section 10.3 of this PEIR) details three recorded pollution incidents to controlled waters which have occurred within the Project Site; however none of these incidents occurred within the last 5 years. Please see Table 9.5 below for further details. Further incidents have been recorded outside of the proposed Project area red line boundary, these are not recorded below.

Table 9.5 - Pollution Incidents

Number	Incident Date	Pollutant	Receiving Water	Category	NGR
1	7th November 1997	Miscellaneous – Vehicle Washing and De Waxing	Freshwater stream/river – Tributary River Waveney	Category 3 – Minor Incident	613000 275600
2	16th April 1996	Crude Sewage	Freshwater stream/river – Tributary River Waveney	Category 3 – Minor Incident	612900 275600
3	1st December 1995	Sewage – Treated Effluent	Freshwater stream/river – River Waveney Stuston Beck	Category 2 – Significant Incident	61290 275600

9.7.7 Two groundwater water abstraction operators are recorded within the Envirocheck report at distances of less than 500 m from the Project Site: RJB Starke and RWB Starke & Sons. The Envirocheck report details that water abstractions from these operators occur at 286 m, 376 m, 380 m, 418 m, 421 m and 422 m from the boundary. In all cases the permitted end date of the water abstraction licence is not provided therefore it is not known whether these abstractions are still operational. Water has been abstracted from these points for general agricultural use along with other industrial/commercial/public services.

9.7.8 No surface water abstraction licences are recorded within the Project Site.

9.7.9 Within the Project Site both historical and operational discharge consents are recorded for the following operators within the Envirocheck report:

- Roy Humphrey Group;
- Stramit Industries Ltd;
- Fibropower Ltd; and
- Anglian Water Services Ltd.

9.7.10 The consents are listed as discharging sewage discharges final/treated effluent and trade effluent into surface water bodies. The receiving bodies include: ditch tributaries of the River Waveney, Thrandeston Water Course, tributaries of the River Dove and the River Dove.

9.7.11 Discharge consents will be explored in more detail within the full ES chapter.

9.7.12 Historical Ordnance survey maps contained within the Envirocheck report dated 27th June 2013 have been assessed. These are dated between the late 1800s to the present day. These maps do not identify any former watercourses in the area. A more detailed assessment of these historical maps is provided in Sections 10 (Ground Conditions) and Section 14 (Cultural Heritage) of this PEIR.

Hydrogeology

9.7.13 The bedrock of the proposed Project area is classified as a Principal Aquifer. The aquifer has a very low vulnerability to pollutants given the low permeability / leaching potential of the superficial deposits and soils overlying the site. Please see Section 10 Geology, Land Contamination and Agriculture for more information regarding the soils and geology underlying the proposed Project.

9.7.14 Although the bedrock principal aquifer is of high sensitivity, given its depth and protection afforded by overlying low permeability deposits, there are not anticipated to be any impacts arising from the development of the proposed Project. The hydrogeology of the site is explored in more detail in Section 10 Geology, Land Contamination and Agriculture.

Flood Risk

9.7.15 The whole Project site is located with Flood Zone 1 and thus is not considered to be at risk from fluvial flooding.

9.7.16 The River Dove runs to the south of the Power Generation Plant site (and is outside the Project Site). The channel and banks of this river are classified as a Flood Zone 3 i.e. without defences this area has a 1% (1 in 100) or greater chance of flooding each year. This will be assessed further by a standalone FRA which will form an Appendix to the final ES and accompany the proposed DCO Application.

Gas Connection Route Corridor Option 1

9.7.17 This route which passes directly from the Power Generation Plant site, into the Diss Gas Compression Station, will not need to cross any surface water bodies. The route passes solely through Flood Zone 1 and thus not considered to be at risk of flooding. The route falls within the nitrate vulnerable zone which encompasses the Power Generation Plant site, although it is just outside the GSPZ III.

9.7.18 The bedrock of the Gas Connection option 1 is classified as a Principal Aquifer. The aquifer has a very low vulnerability to pollutants given the low permeability / leaching potential of the superficial deposits and soils overlying the site. Please see Section 10 Geology, Ground Conditions and Agriculture for more information regarding the soils and geology underlying the route corridor.

9.7.19 Although the bedrock principal aquifer is of high sensitivity, given its depth and protection afforded by overlying low permeability deposits, there are not anticipated to be any impacts on the aquifer arising from the development of the proposed route corridor. Furthermore there will be no impacts on surface water in the area.

Gas Connection Route Corridor Option 2

9.7.20 Although this route is longer than Option 1 described above, there is are no significant differences between the baseline conditions for Gas Connection Route Corridor Option 2 and Gas Connection Route Corridor Option 1.

Electrical Connection Compound Option 1 and Electrical Connection Option 1

9.7.21 The proposed site area of the Electrical Connection Compound Option 1 and the route of Electrical Connection Option 1 contain a number of surface water courses, but the Electrical Connection and the Electrical Connection Compound will be designed and located so as to avoid these water courses. As with the Gas Connection, the Electrical Connection routes are not anticipated to cross any areas that are at risk of flooding. However, the electrical cables are designed such that even

if they are submerged with water they can still operate with no detriment to performance. M

9.7.22 Construction and operational access to the Electrical Connection Compound would be via a new access road, which would likley follow the route of the preferred electrical connection option.

Electrical Connection Compound Option 2 and Electrical Connection Option 2

9.7.23 Although there are slightly fewer surface water bodies within the area outlined within Electrical Connection Compound Option 2 and Electrical Connection Option 2, there is are no material differences between the baseline conditions for Electrical Connection Compound Option 2 and Electrical Connection Option 2 and Electrical Connection Compound Option 1 and Electrical Connection Option 1.

Conceptual Site Model

9.7.24 Table 9.6 provides a tabular representation of a conceptual site model (CSM). The CSM is a representation of the potential pollutant linkages arising from water usage for the construction, operation and decommissioning of the proposed Project. The CSM identifies a source (of pollution) a pathway and a potential receptor. A potential impact can only occur if all three components are present.

9.7.25 The table shows that potential contaminants within the Project site include unknown contaminants which are already present within the soil and the accidental spillage of liquids including diesel and oil. Potential pathways of these pollutants from the source to the receptor include drilling / piling into the principal aquifer and surface water runoff and the potential receptors at the site include local surface water courses, the principal aquifer and site workers.

Table 9.6 - Conceptual Site Model

Source	Potential Contaminants	Potential Pathways	Potential Receptors
Construction / decommissioning activities could lead to the mobilisation of contaminants already within the topsoil.	Potential contaminants within the topsoil are unknown at this stage.	Drilling /piling for foundations provide pathway to groundwater Surface water / ground water	Local surface water courses. Public sewerage network. Site workers.
Accidental spillages via vehicles.	Diesel / oil.	Surface water runoff.	Principal aquifer. Public sewerage network. Site workers.

9.7.26 The CSM is useful to show the potential pollutant linkages however it does not predict the likelihood of their occurrence. It is anticipated that there is a very minimal risk that any of the pathways listed in the table above will be created. Due to the depth of the overlying unproductive strata, potential piling for foundations (if required) would not reach the principal aquifer and therefore no pathway would be created. Additionally any on-site surface water runoff will be captured by the surface water drainage system thus no contaminated runoff will be created.

9.8 Preliminary Assessment of Potential Impacts

POWER GENERATION PLANT

Construction

9.8.2 A small amount of water will be required each day for the general construction works (e.g. wheel washing and dust suppression) and hygiene. This water will likely be brought in by bowser or and therefore no surface water or groundwater abstraction will be required. The

impact of construction on water use from local sources with therefore be minimal. An alternative option of using potable water from the town supply will be assessed in the ES.

9.8.3 Construction activities could require the disposal of water from the site. Therefore all construction contractors will be required, in conjunction with PPL, to reach an agreement with the EA with regard to detailed methods of disposal.

9.8.4 During construction, if it is necessary to install a temporary diesel storage tank for onsite construction machinery, generators etc. on-site this will be double-skinned and/or contained with an impermeable bund sized to hold 110 per cent of the total tank contents for the prevention of releases to the environment. Maintenance of construction machinery, on-site, will be forbidden outside suitably kerbed or bunded areas to prevent the accidental leakage of lubricating and hydraulic fluids. Therefore the impact of accidental spillages during construction will be negligible.

9.8.5 Construction activities, if uncontrolled, could potentially cause leaching to surface waters due to the creation of soil piles formed during excavation, levelling and other such on-site works. Impacts could include the potential eutrophication of surrounding watercourses. However, there are not anticipated to be any impacts on the water bodies listed above as the majority are a significant distance from the site and therefore will not be directly impacted during construction. Furthermore, as this is the case it is considered that at this site a WFD Report is not required to assess the surrounding water bodies. Further consultation will be undertaken with the EA to confirm this.

9.8.6 Given the above, and the lack of any surface waterbodies within the vicinity of the proposed Power Generation Plant, the preliminary findings are that the impacts on Water Resources from the construction of the Power Generation Plant would be negligible.

Operation

9.8.7 The largest operational demand for water in the majority of UK power stations is cooling. However the Power Generation Plant will be air cooled therefore no water will be required to cool this plant and only minimal qualities will be required for operational purposes. Therefore the impacts on water requirements will be negligible.

9.8.8 Water use on-site will be limited to NOx control, potable water for drinking and sanitation purposes and plant washing. Domestic/sanitary water use will be approximately 200 litres per person per day (c. 30 m3/day). For NOx control it is anticipated that the plant will require a

worst case scenario of 69 m3 per hour. Assuming a water tank on site capable of storing 6000 m^3, there is enough capacity for up to 3.6 days continuously running the plant, 24 hrs per day. However, as the plant will operate in 'peaking mode' (anticipated at <1500 hrs per year) the maximum potential water use required for NOx control will be approximately 103,000m^3 per year.

9.8.9 The water used for NOx control will all be used up during the process, and therefore no residual water will be discharged.

9.8.10 Due to the intermittent water demand of the plant, it is likely that all water will be tankered to site and stored in water storage tanks adjacent to the administration buildings. An alternative option of using potable water from the town supply will also be assessed in the ES.

9.8.11 The Power Generation Site will be equipped with a surface water drainage system and a sewerage system. The intricacies of these systems will be confirmed within the detailed design stage. It is anticipated at this stage that the on-site sewerage system will connect to a new onsite septic tank that will be maintained and emptied by suitable contractors. The surface water drainage system will discharge into an attenuation pond in the north of the Power Generation Site. It is not anticipated that surface water drainage will require specialist treatment for oils. Surface water drainage will be uncontaminated and typical of surface water runoff from areas of hardstanding and roads. Before reaching the main sewerage network the runoff will pass through oil interceptors / filters. Therefore impacts on water courses of accidental spillages and leaks will be negligible.

9.8.12 The proposed Project will lead to a slight increase in the amount of runoff from within the Power Generation Plant site boundary due to the increase in hardstanding. However this additional runoff will be captured by the surface water drainage system so that existing greenfield runoff rates are not exceeded.

9.8.13 An assessment of the potential for the application of SUDS at the proposed Project will be undertaken at a more detailed scale during the final EIA and then at a more detailed design stage once an appropriate plant supplier has been selected. The SUDS would, if feasible, be used to retain non-contaminated surface water on-site for release at a controlled and sustainable rate to the existing local drainage ditches or soakaways. The feasibility and design will be agreed in advance with the EA as stated in the scoping responses.

9.8.14 Occasionally it will be necessary to wash the blades of the air compressor section of the gas turbine to remove debris that has penetrated the air inlet filters and become lodged on the compressor

blades. This will be done at times when the performance of the GT has degraded and will depend on the air quality in the vicinity of the Project site.

9.8.15 Washing can be done in two ways, either:

- On-line washing where a fine spray of water is allowed to pass through the gas turbine; or,
- Off-line washing where the compressor blades are rotated slowly through a detergent solution.

9.8.16 Any water generated during washing will be retained on-site in an attenuation pond and will be subsequently tankered off-site by a licensed contractor for disposal at an appropriately licensed disposal facility.

9.8.17 The anticipated water requirement for washing will be of the order of 11.5 m^3 per wash.

Decommissioning

9.8.18 During decommissioning, it is not anticipated that there will be any material differences in the impacts on Water Resources from those described for the construction phase.

GAS CONNECTION ROUTE CORRIDOR OPTION 1

Construction

9.8.19 Gas Connection Route Corridor Option 1 does not pass in close proximity to any water bodies. The closest water body to Gas Connection Route Corridor Option 1 is located approximately 400 m to the north east of the corridor boundary. Additionally, the same embedded mitigation measures will be used during construction as will be used during construction of the Power Generation Plant (e.g. working to best practice and in line with a detailed CEMP). It is therefore considered likely that any construction activities for this Gas Connection will have a negligible effect on the water resources in the area.

9.8.20 Although the bedrock principal aquifer underlying this route corridor option is highly sensitivity, given its depth and protection afforded by overlying low permeability deposits, there are not anticipated to be any construction activities that could impact on the aquifer.

9.8.21 Prior to operation the gas pipeline will be hydrostatically tested by closing off the ends, filling it with water and increasing the pressure to a pre-determined level higher than the pressure at which it is designed to operate.

9.8.22 The water used during hydrostatic testing would likely be tankered to and from site, from where it will be disposed as a suitable disposal facility.

Operation

9.8.23 As the Gas Connection would be a buried pipeline, once operational, the pipeline will have no impacts on any surrounding waterbodies or ground water. Furthermore, there is no operational water requirement for this element of the proposed Project.

9.8.24 As such, the findings of this preliminary assessment are that Gas Connection Route Corridor Option 1 would have negligible impacts on the Water Resources of the area.

Decommissioning

9.8.25 Following the decommissioning of the plant, it is anticipated that the Gas Connection pipe would be left in-situ, as removal of the pipe would cause more environmental disruption than leaving it in place.

9.8.26 As such, there are no decommissioning activities for this element of the Project which would require water and as such the impacts on Water Resources are negligible.

GAS CONNECTION ROUTE CORRIDOR OPTION 2

Construction, Operation & Decommissioning

9.8.27 Although Gas Connection Route Corridor Option 2 is longer than Option 1, this option also does not cross or pass within close proximity to any surface waterbodies, with the closest water body located to the south side of Castleton Way, thus producing a barrier between the pipe and the watercourse. As such, at this preliminary stage, there are not considered to be any material differences between the impact of this option and those of Option 1 described above, during the construction, operation or decommissioning phases.

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 1

Construction

9.8.28 Electrical Connection Compound Option 1 is located in an area that contains several unnamed surface water features. As such, it is likely that these features may need to be crossed, or culverted to facilitate the construction of the Electrical Connection Compound. Such works, if required, would be carried out to industry best practices to ensure that the potential impacts of such works are minimised as much as possible. In addition, all relevant permits to work within close proximity to these water bodies will be obtained prior to commencement, once the final design of the Electrical Connection Compound and Electrical Connection has been decided.

9.8.29 It is considered likely that a Water Framework Directive report will be required for this element of the proposed Project and the scope of that report will be agreed with the Environment Agency during the consultation process.

9.8.30 Furthermore, this Option is located above a Principal Aquifer. However, the aquifer has a very low vulnerability to pollutants along the connection route given the low permeability / leaching potential of the superficial deposits and soils overlying the aquifer. Part of Electrical Connection Compound Option 1 falls with an area of groundwater vulnerability designated as intermediate 1 (as stated within an Envirocheck report). This means that it is possible for the soils at this location to transmit a wide range of pollutants.

9.8.31 Although the bedrock principal aquifer is of high sensitivity, given its depth and protection afforded by overlying low permeability deposits along the majority of the route, there are not anticipated to be any impacts on the aquifer arising from the development of the proposed route corridor. It is unknown at this stage the exact Electrical Connection route within the width of the option, however there is the potential for the requirement of water crossings.

9.8.32 The construction of the Electrical Connection Compound will require a number of activities similar to those described for the construction of the Power Generation Plant, including large excavations. As such, it is likely that the construction of the Compound and the Electrical Connection in this location may have a number of significant and permanent impacts on these watercourses.

Operation

9.8.33 During Operation, the Electrical Connection itself will be buried and will therefore have no impact on Water Resources while water usage at the Electrical Connection Compound is expected to be minimal.

9.8.34 Construction of a permanent access route along the connection route will result in the generation of additional surface water runoff. However, this is likely to be minimal and would be controlled with an appropriately designed drainage system.

9.8.35 As such, the impact on water resources arising from the Operation of Electrical Connection Compound 1 and Electrical Connection 1 is considered to be negligible.

Decommissioning

9.8.36 During decommissioning, it is not anticipated that there will be any material differences in the impacts on Water Resources from those described for the construction phase.

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 2

Construction

9.8.37 Electrical Connection Compound Option 2 is also located in an area that contains a number of surface water features, although the number and density of these features is lower than those described for Electrical Connection Compound Option 1.

9.8.38 Furthermore, Electrical Connection Route Option 2 would follow much of the same course as that of Option 1 on the east side of the A140. On the west if the A140, the current route corridor contains fewer surface water features than Electrical Connection Route Option 2.

9.8.39 Based on the preliminary assessment to date, it is anticipated that the impacts of Electrical Connection Route Option 2 will be similar to those described for Electrical Connection Route Option 1, but to a lesser extent due to the reduced number of water bodies. As such, it is anticipated that the same permits to work within close proximity to these water bodies will be obtained prior to commencement and that a WFD report will be required to be submitted with the proposed DCO application.

9.8.40 The impact on the underlying aquifer is expected to be similarly negligible, due to the same unproductive overlying strata.

Operation

9.8.41 There are not expected to be any material differences in the impacts on Water Resources during operation from those described for Electrical Connection Compound Option 1 and Electrical Connection Route Option 1.

Decommissioning

9.8.42 There are not expected to be any material differences in the impacts on Water Resources during decommissioning from those described for Electrical Connection Compound Option 1 and Electrical Connection Route Option 1.

9.9 Potential Mitigation / Management Techniques

Power Generation Plant

9.9.2 During construction, mitigation measures would be covered by a CEMP. A draft of this document will be submitted as part of the proposed DCO Application.

9.9.3 Mitigation measures during construction, operation and decommissioning will include, as appropriate:

- Any surface water contaminated by hydrocarbons to be passed through oil/grit interceptors prior to discharge;
- Measures will be taken to ensure that no leachate, or any surface water that has the potential to be contaminated, will be allowed to enter directly or indirectly any water course, underground strata or adjoining land;
- Water inflows to excavated areas will be minimised by the use of lining materials, good housekeeping techniques and by the control of drainage and construction materials in order to prevent the contamination of ground water. Site personnel will be made aware of the potential impact on ground and surface water associated with certain aspects of the construction works to further reduce the incidence of accidental impacts;
- Refuelling of construction vehicles and equipment will be restricted to a designated area with properly designed fuel tanks and bunds and suitable operating procedures.
- Siting of stockpiles a minimal distance from watercourses to avoid pollution runoff and adhering to best practice working guidelines to avoid spillages near watercourses;

- All oil and chemical storage tanks and areas where drums are stored will be surrounded by an impermeable bund. Single tanks will be within bunds sized to contain 110 per cent of capacity and multiple tanks or drums will be within bunds sized to contain the greater of 110 per cent of the capacity of the largest tank or 25 per cent of the total tanks contents; and
- During operation, the EA will set limits on the quality of water that is discharged from the site under the Environmental Permit. The need for any further, specific mitigation measures will be determined through the EIA process.

9.9.4 The British Standard Code of Practice for Earthworks BS 6031:2009 contains detailed methods that should be considered for the general control of drainage on construction sites. Further advice is also available in the British Standard Code of Practice for Foundations BS 8004: 1986. These will be taken into account.

Gas Connection Options 1 and 2

9.9.5 All proposed mitigation measures identified for the proposed Project will be considered for the construction and decommissioning periods of the Gas Connection depending on the findings of the final impact assessment to be completed for the full ES accompanying the proposed DCO Application.

Electrical Connection Compound and Connections 1 & 2

9.9.6 All proposed mitigation measures identified for the proposed Project will also be considered for the construction and decommissioning periods of the Electrical Connection Compound and Electrical Connection depending on the findings of the final impact assessment to be completed for the full ES accompanying the proposed DCO Application.

9.10 Preliminary Assessment of Residual Effects

9.10.1 On the basis of the preliminary environmental information and assessment described above, taking into account potential mitigation measures, potential residual impacts are detailed in Table 9.7 below.

Table 9.7 - Summary of Potential Residual Impacts

Description	***Detail***	***Unmitigated Potential Impact***	***Mitigation / Monitoring Measure***	***Residual Impact***
Power Generation Plant				
Construction	Water requirements from local water sources	Negligible (minimal water requirements, all water brought to site by bowser)	N/A	N/A
	Water disposal	Likely Negligible if tankered away however, impact not known until the method of disposal has been agreed by the construction contractor)	N/A	N/A
	Accidental spillages / leakages to ground and surface water	Moderate	Bunded storage tanks / regular maintenance	Negligible
Operation	Water requirements	Negligible (water only required for domestic / hygiene purposes)	N/A	N/A

	Accidental spillage / leakages to ground and surface water	Moderate	SUDS	Negligible
Decommissioning	As for construction	As for construction	As for construction	As for construction
Gas Connection Route Corridor Option 1				
Construction	Accidental spillages / leakages to ground and surface water	Moderate	Bunded storage tanks / regular maintenance	Negligible
Operation	No further impacts on water resources / water quality	N/A	N/A	N/A
Decommissioning	As for construction	As for construction	As for construction	As for construction
Gas Connection Route Corridor Option 2				
Construction	Accidental spillages / leakages to ground and surface water	Moderate	Bunded storage tanks / regular maintenance	Negligible
Operation	No further impacts on water resources / water quality	N/A	N/A	N/A

Decommissioning	As for construction	As for construction	As for construction	As for construction
Electrical Connection Compound 1 and Electrical Connection 1				
Construction	Accidental spillages / leakages to ground and surface water	Moderate	Bunded storage tanks / regular maintenance	Negligible
	Culverting / Rerouting of surface water bodies	Permanent loss of water body and aquatic habitat	Best practice engineering to reroute water body to maintain hydraulic connectivity	Permanent rerouting of surface water bodies
Operation	No further impacts on water resources / water quality	N/A	N/A	N/A
Decommissioning	As for construction	As for construction	As for construction	As for construction
Electrical Connection Compound 2 and Electrical Connection 2				
Construction	Accidental spillages / leakages to ground and surface water	Moderate	Bunded storage tanks / regular maintenance	Negligible

	Culverting / Rerouting of surface water bodies	Permanent loss of water body and aquatic habitat	Best practice engineering to reroute water body to maintain hydraulic connectivity	Permanent rerouting of surface water bodies
Operation	No further impacts on water resources / water quality	N/A	N/A	N/A
Decommissioning	As for construction	As for construction	As for construction	As for construction

9.11 Next Steps

9.11.1 The following next steps will be undertaken in order to complete the assessment of potential impacts on water quality from the proposed Project:

- Refinement of Electrical Connection Route Corridor options to establish magnitude of impact on individual water bodies;
- WFD assessment on waterbodies likely to require modification; and
- A full environmental impact assessment.

SECTION 10

GEOLOGY, GROUND CONDITIONS AND AGRICULTURE

10 GEOLOGY, GROUND CONDITIONS AND AGRICULTURE

10.1 Introduction

10.1.1 This section of the PEIR provides a preliminary assessment of the likely significant effects on geology, ground conditions and agriculture that could result from the development of the proposed Project. It will also assess the likely significant effects of contamination (existing or created) on human health and sensitive ecological receptors.

10.1.2 This preliminary assessment considers the impacts of each element on the proposed Project, namely the Power Generation Plant, Gas Connection Route Corridor Option 1, Gas Connection Route Corridor Option 2, Electrical Connection Compound Option 1 and Electrical Connection Option 1 and Electrical Connection Compound Option 2 and Electrical Connection Option 2.

10.2 Legislative and Policy Context

National Policy Statements

10.2.2 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

10.2.3 The relevant assessment principles in terms of generic impacts ('Biodiversity and Geological Conservation' and 'Land Use including Open Space, Green Infrastructure and Green Belt' and 'Waste Management') from Part 5 of NPS EN-1 (Generic Impacts) are set out below:

NPS EN-1: Generic Impacts – Biodiversity and Geological Conservation

10.2.4 Under Applicant's Assessment (Paragraphs 5.3.3 to 5.3.4):

10.2.5 "Where the development is subject to an EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological and geological conservation importance, on protected species and on habitats and

other species identified as being of principal importance for the conservation of biodiversity.

10.2.6 The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests".

NPS EN-1: Generic Impacts – Land Use including Open Space, Green Infrastructure and Green Belt

10.2.7 Under Applicant's Assessment (Paragraphs 5.10.5 to 5.10.12):

10.2.8 "The ES should identify existing and proposed land uses near the project, any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. Applicants should also assess any effects of precluding a new development or use proposed in the development plan.

10.2.9 Applicants will need to consult the local community on their proposals to building on open space, sports or recreational buildings and land. Taking account of the consultations, applicants should consider providing new or additional open space including green infrastructure, sport or recreation facilities to substitute for any losses as a result of their proposal. Applicants should use any up-to-date Local Authority assessment or, if there is none, provide an independent assessment to show whether the existing open space, sport and recreational buildings and land is surplus to requirements.

10.2.10 During any pre-application discussions with the applicant, the Local Planning Authority should identify any concerns it has about the impacts of the application on land use, having regard to the Development Plan and relevant applications and including, where relevant, whether it agrees with any independent assessment that the land is surplus to requirements.

10.2.11 Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as Grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in area of poorer quality (Grades 3b, 4 and 5) except where this would be inconsistent with other sustainability considerations. Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures propose. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination.

10.2.12 Applicants should safeguard any mineral resources on the proposed site as far as possible; taking into account the long-term potential of the land use after any future decommissioning has taken place.

NPS EN-4: Gas Supply Infrastructure and Gas and Oil Pipelines

10.2.13 Section 2.23 of EN-4 discusses the potential impacts on soil and geology and recognises the importance of understanding the underlying soil conditions and geology. This section states that applicants should assess the stability of ground conditions via a desktop study and if necessary new borehole data. It also states that the assessment should cover options considered for installing pipelines and weigh up impacts of means of installation.

Environmental Protection Act 1990

10.2.14 Part 2A of the Environmental Protection Act (EPA) 1990 deals with contaminated land. The contaminated land regime within Part 2A was first introduced in Wales on the 15th September 2001 and was inserted into the EPA 1990 by Section 57 of the Environment Act 1995.

10.2.15 The EPA 1990 defines contaminated land as “any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substance in, on or under the land, that –

a) Significant harm is being caused or there is a significant possibility of such harm being caused; or

b) B) Pollution of controlled waters is being or is likely to be caused.”

10.2.16 The contaminated land scheme provides guidance on what is considered to be contaminated land. Furthermore it requires the local enforcing authority to require remediation of this land and to identify the appropriate person to bear the responsibility for this.

Other National and Local Policy

10.2.17 Whilst the PA 2008 is clear as to the primacy of the relevant NPS, other national and local planning policy can be considered important and relevant by the Secretary of State (SoS) in the determination of energy NSIP.

10.2.18 The NPPF states (paragraph 120) that “to prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be

taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner."

10.2.19 Both local planning policies and decisions, under the direction of the NPPF, should ensure that the ground conditions of a proposed site are suitable for the proposed new use of that site. The NPPF states (paragraph 122) "local planning authorities should focus on whether the development itself is an acceptable use of the land, and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes. Local planning authorities should assume that these regimes will operate effectively."

10.2.20 Remediation of contaminated land is required (paragraph 121), as a minimum, to be such that "land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990."

10.2.21 The Core Strategy of the Mid Suffolk LDF aims to set out the vision, objectives, spatial strategy and core policies that will guide development across the district until 2025 and beyond. The Core Strategy has 15 Core Objectives, the most relevant to this chapter is as follows: Core Strategy Objective 1 "to protect, manage, enhance and restore the landscape biodiversity and geodiversity of the district."

10.2.22 The specific provisions relating to geology, ground contamination and agriculture within the Core Strategy and the saved policies of the Mid Suffolk Local Plan will be discussed in the final ES chapter and the separate Planning Statement that will be prepared to accompany the proposed DCO Application.

10.3 Project Scenario for Assessment

10.3.1 In respect of geology, ground conditions and agriculture, the project scenario that is considered the realistic worst case from within the proposed Project parameters (which are described in Section 3 of the PEIR) are set out in Table 10.1 below.

Table 10.1 - Worst case parameters for the proposed Project considered within this assessment

Parameters	Details
Power Generation Plant	
Number of gas turbine units	5 (~ 59 MW)

Number of stacks	5
Unit type	Aero derivative

10.3.2 The different options for the configuration of the Power Generation Plant outlined in Sections 3 and 4 of this PEIR have little bearing on the impact to geology, ground conditions and agriculture. Five separate units will have marginally more land take than a smaller number of units. However, as the Power Generation Site will need to be covered in hard standing regardless of the number of units, the impacts arising from the Power Generation Plant on geology, ground conditions and agriculture are similar for each potential configuration.

10.3.3 A preliminary assessment of both options for the Gas Connection, Electrical Connection and Electrical Connection Compound is presented in this section.

10.4 Assessment Methodology and Significance Criteria

10.4.1 Table 10.2 to Table 10.4 have been used to assess and attribute the importance of receptors and the significance criteria against which the magnitude of potential impacts from the proposed Project may have on soils, geology, hydrogeology and human health. In addition, a Conceptual Site Model (CSM) approach has been used to assess the risks posed by contaminants to human health using a source, pathway receptor model, based on the following:

- Source – potential source of contamination.
- Pathway – means by which contamination can reach and impact upon a receptor.
- Receptor – that which may be adversely affected by the presence of contamination.

10.4.2 The baseline geological, hydrological and hydrogeological conditions of the proposed site have been assessed with reference to the following:

- Landmark Envirocheck Report – which includes the following:
  - Groundwater Vulnerability Map;
  - Historical plans;
  - Details of discharge and waste consents, contaminated land sites and areas of sensitive land use etc.; and
  - Geological and mining hazards.

- Soilscape website; and
- MAGIC (Multi Agency Geographic Information for the Countryside) website.

Standards and Guidance

10.4.3 The following standards and guidance have been consulted to provide advice on best practice mitigation measures which will be employed during the construction phase of the proposed Project and the correct methods of assessment of potentially contaminated sites.

10.4.4 BS 6031 (2009) provides best practice guidance on geotechnical aspects of earthworks and on working practices. The standard also includes recommendations and guidance for un-reinforced earthworks forming part of general civil engineering construction, together with provisions for temporary excavations such as trenches and pits.

10.4.5 Technical guidance relating to land contamination is presented in a series of documents known as the Contaminated Land Report (CLRs 1 to 6 and 11) published by the EA. The guidance promotes a tiered approach to the assessment of contamination and associated risks. The baseline conditions of the Project Site have been assessed with specific reference to CLR 11: Model Procedures for the Management of Land Contamination (2004).

10.4.6 British Drilling Association document 'Guidance for Safe Intrusive Activities on Contaminated or Potentially Contaminated Land' (BDA, 2008).

Significance Criteria

10.4.7 Table 10.2 to Table 10.4 define the criteria against which the magnitude and significance of impacts has been defined on a variety of receptors of varying sensitivity.

Table 10.2 - Defining Attribute Importance for Receptors

	Attribute Type						
Attribute Sensitivity	**Geology/Soils**	**End users**	**Construction Workers**	**Surrounding Land Uses**	**Controlled Waters**	**Ecological Systems**	**Built Environment**
High	Designated SSSI for geology/soils Grade 1 agricultural land Land supports nationally rare plant species	Residential, allotments, play areas	Extensive earthworks and demolition of buildings	Greenfield site / residential area	Principal aquifer or surface water in close proximity to site	Nationally or internationally designated sites	Listed buildings of high historic value or other sensitivity
Medium	Grade 2/3 agricultural land Currently used for important crops Land supports regionally/locally rare plant species	Landscaping or public open space	Limited earthworks	Open space, commercial area	Secondary aquifer	Locally designated ecological sites	Buildings, including services and foundations
Low / Negligible	Brownfield / industrial site. Site of little or no agricultural value.	'Hard' end use (e.g. industrial, car parking)	Minimal ground disturbance	Industrial area	No surface water bodies or aquifers close to the site	No sites of ecological importance close by.	N / A

Table 10.3 - Criteria for Assessing the Magnitude of Impacts

Magnitude		Description
Major Impact	**Adverse**	A permanent or long term adverse impact on the integrity and value of an environmental attribute or receptor, or exposure to acutely toxic contaminants. For example, harm to human health, designated habitats or pollution to controlled waters.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate Impact	**Adverse**	An adverse impact on the integrity and/or value of an environmental attribute or receptor, but recovery is possible in the medium term and no permanent impacts are predicted.
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of attribute quality.
Minor Impact	**Adverse**	An adverse impact on the value of an environmental attribute or receptor, but recovery is expected in the short-term and there would be no impact on its integrity. For example, temporary effects on receptors not designated under environmental legislation.
	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on attribute or a reduction in the risk of a negative impact occurring.
Negligible impact	**-**	No impact would be detectable, either positive or negative.

Table 10.4 - Defining Significance Criteria

		Magnitude of Change			
		Major	**Moderate**	**Minor**	**Negligible**
Importance of Receptor	**High**	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Minor
	Low	Moderate	Minor	Minor	Minor
	Negligible	Minor	Minor	Negligible	Negligible

10.5 Embedded Design Mitigation

10.5.1 The proposed Project has been designed from the outset to ensure its impacts are minimised. This includes mitigation that is embedded into the design of the Power Generation Plant, Gas Connection, Electrical Connection and Electrical Connection Compound and industry standard methods and procedures to ensure impacts from construction, operation and decommissioning are minimised. In respect of geology, ground conditions and agriculture, such mitigation could include:

- Minimising land take where possible;
- Avoiding the need for piled foundations where possible; and
- Design the Gas Connection and Electrical Connection to follow field boundaries as much as possible to reduce the loss of agricultural land.

10.5.2 The assessment in this section takes such design mitigation into account. Any additional mitigation developed in response to specific impacts identified in this assessment is described in Section 10.9 below.

10.6 Consultation

10.6.1 Table 10.5 below presents a summary of the Scoping Responses received in response to the proposed Project Scoping Report in relation to Geology, Ground Conditions and Agriculture

Table 10.5 - Scoping Consultation

Reference	Comment	Actions
PLANNING INSPECTORATE		
Geology and soils including ground conditions and land use 3.43	The SoS welcomes that there will be assessment of ground and water contamination. The baseline for the ES should explain in detail the extent of the study area, ensuring that the impacts are considered over a sufficiently wide area and provide the reasons to justify this.	The details of this assessment will be detailed in the full ES chapter.
3.44	The SoS welcomes that there will be full consideration of the impact of the proposal on soils as an agricultural resource.	No Action Required
3.45	The SoS refers the applicant to the comments raised by the EA and the need for early engagement with them. The SoS notes that the ES will need to address ground conditions and contaminated land fully and the approach to the assessment should be agreed in consultation with the EA.	Engagement with the EA was established prior to the issue of the scoping report and will continue until final submission of the ES.
SUFFOLK COUNTY COUNCIL		
Geology, ground conditions and agriculture 80	The section recognises the potential for sterilisation of agricultural ground in the connection corridors. This also applies of course to the main site and in both locations the quality of the land lost should be described.	A preliminary assessment of the impact on agricultural land has been provided in this chapter and further details will be provided in the ES.
81	The ES should clarify the depth of soil that will remain above any buried cables and pipes and so available for agricultural operations.	The depths of both the underground pipeline and cabling will be clarified

	Although it is stated that the pipe depth will be ”at least 1.1 m” for the gas pipe (3.4.10) (not described for underground cables), it is important to understand the depth of soil that will be available for cultivation and if this will be sufficient to facilitate all normal arable operations such as sub-soiling.	in the final ES chapter once the routes have been refined.
82	If the soil above cables/pipes is not available for these deeper arable operations, this may impact on arable farming operations (including through land sterilisation), and consequently result in landscape change. The impacts of undergrounding on soil conditions (soil structure and field drainage) more generally should also be considered.	There is a possibility that a small amount of agricultural land may be sterilised. The actual amount will be quantified and mitigation measures proposed in the ES when the preferred route has been defined.
83	As EN-1 notes (5.10.23), where a Project has a sterilising effect on land use there may be scope for this to be mitigated through, for example, using or incorporating the land for nature conservation or wildlife corridors or uses ancillary to the development, for example access (vehicular or non-motorised users).	Such opportunities will be considered in full in the ES once the routes have been defined.
MID SUFFOLK DISTRICT COUNCIL		
Geology, ground conditions and agriculture	The ES should be clear about the possible implications of buried pipes and cables on future agricultural activities available to mitigate any potential loss of productive land.	There is a possibility that a small amount of agricultural land may be sterilised. The actual amount will be quantified and mitigation measures proposed in the ES when the preferred route has been defined
	In view of the former WW2 use of the site the investigation for potential contaminants should be extended to include munitions.	This has not been included within the PEIR section however the full ES investigation will include munitions and potential for un exploded ordinance.

HEALTH AND SAFETY EXECUTIVE (HSE)		
Major Hazard Installations	This application falls within the Consultation Distance of a Major Hazard Site and two Major Accident Hazard Pipelines. In line with PADHI+ guidance we would advise against features that are more than 3 occupied storeys or allowed occupation by 100 or more workers. Based on the information contained in the EIA scoping report, it seems likely that the occupied buildings forming part of the proposal would not meet the above criteria, so would not meet the criteria for HSE to advise against.	It can be confirmed, in line with the scoping report, that the development will not meet the criteria of the HSE for the HSE to advise against.
Hazardous Substances Consent	The presence on, over or above land of certain hazardous substances, at or above set threshold quantities (Controlled Quantities), may require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others, for which HSC is required, and the associated Controlled Quantities, are set out in The Planning (Hazardous Substances) regulations 1992 as amended particularly by The Planning (Hazardous Substances) (Amendment) (England) regulations 2009 and 2010, as well as Planning (Control of Major Accident Hazards) Regulations 1999.	It is not anticipated that Hazardous Substances Consent will be required as no substances listed in Schedule 1 of these Regulations will be used or stored on-site.
	Hazardous Substances consent would be required if the site is intending to store or use any of the Named Hazardous Substances or Categories of Substances and Preparations at or above the controlled quantities set out in schedule 1 of these regulations. Further information on HSC should be sought from the relevant Hazardous Substances authority.	
Gas Connection	The proposed Gas Connection may be classified as a Major Accident Hazard Pipeline under the Pipeline Safety Regulations 1996. If this is the case then notification will be required as	Consultation with National Grid Gas is ongoing and notifications will be made prior to submission of the

	specified in the regulations.	proposed DCO Application if they are required.
NATURAL ENGLAND		
Soil and agricultural land quality	Impacts from the development should be considered in light of the Government's policy for the protection of the best and most versatile (MWV) agricultural land as set out in paragraph 112 of the NPPF. We also recommend that soils should be considered under a more general heading of sustainable use of land and the ecosystem services they provide as a natural resource in line with parapgraph 109 of the NPPF.	An overall consideration of soils is provided within this preliminary information and a more detailed discussion will be provided within the ES.
	Soil is a finite resource that fulfils manyimportant functions and services (ecosystem services) for society, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution. It is therefore important that the soil resources are protected and used sustainably.	Details of how impacts on soil will be mitigated will be provided in full in the ES.
	The applicant should consider the following issues as part of the Environmental Statement: The degree to which soils are going to be disturbed/harmed as part of this development and whether 'best and most versatile' agricultural land is involved. This may require a detailed survey if one is not already available. For further information on the availability of existing agricultural land classification (ALC) information see www.magic.gov.uk. Natural England Tehcnical Information Note 049 – Agricultural Land Classification: protecting the best and most versatile agriculutral land also contains useful background information. If required, an agricultural land classification and soil survey of the land should be undertaken. This should normally be at a detailed	A detailed soil survey has not been undertaken at this preliminary stage, but further consultation with NE will guide the decision to carry out this survey or not once the final connection routes have been decided and the total land take of the project is refined.

	level, e.g. one auger boring per hectare, (or more detailed for a small site) supported by pits dug in each main soil type to confirm the physical characteristics of the full depth of the soil resource, i.e. 1.2 metres. The Environmental Statement should provide details of how any adverse impacts on can be minimised. Further guidance is contained in the Defra Construction Code of the Sustainable Use of Soil on Development Sites.	

10.7 Baseline Conditions and Receptors

10.7.1 This section comprises the results of a desk-based assessment (DBA) of information pertinent to geology, ground contamination and agriculture. As part of the full EIA process a more detailed DBA will be carried out, along with further assessments including but not limited to a site walkover.

Site History

10.7.2 A review of Ordnance Survey historical mapping data contained within the Envirocheck report dated from the late 1890s to the present day has been undertaken. The results are as follows.

10.7.3 In the late 1880s to early 1900s the Power Generation Plant site and its immediate surrounds were undeveloped agricultural land divided by field boundaries comprising of scrub and belts of trees. An area of isolated woodland, the Yaxley Plantation, also appeared. The area remained unchanged throughout the 1920s until the late 1930s and early 1940s. In this period clusters of cottages appear in the surrounding area: the Kilncommon Cottages and the Potash Cottages.

10.7.4 In the 1950s a development appears to the north of Potash Lane which borders the north of the Power Generation Plant site. A disused airfield is also labelled on the historical maps, suggesting that an airfield was in use at this location during the 1940s. This airfield is known to be the Eye Airfield, which was used by the United States Army Air Force Eight Air Force 490th Bombardment Group.

10.7.5 In the 1970s a building appears to the north west of the site boundary, this is labelled as Mill Mushroom Farm. In the 1980s developments had appeared to the north, east and south and by the 2000s all boundaries of the Power Generation Plant site were defined and no further changes have occurred since that time other than the erection of two 130 m wind turbines located to the west of the Power Generation Plant site. The Power Generation Plant site itself remains agricultural land forming part of the Airfield, which is noted in the Core Strategy as previously developed land.

Landscape and Topography

10.7.6 The whole of the proposed Project Site is comprised of relatively flat low lying land at approximately 45 m AOD (Above Ordnance Datum). The land is mainly covered by agricultural land, and that on which the proposed Power Generation Plant would be situated is classified as Grade 3 under the Agricultural Land Classification (ALC). This land is classified as being of 'good to moderate quality'.

10.7.7 The remainder of the agricultural land within the Project Site is unclassified by the ALC. However, a site visit has shown that this land is currently used for agricultural purposes and therefore has an intrinsic value and fertility. Additionally, a portion of land to the west of the Power Generation Plant area outside of the Project Site is classified as ALC Grade 3 i.e. good to moderate quality agricultural land. It can therefore be inferred that the land over which the Gas Connection, Electrical Connection and Electrical Connection Compound will cross is of a similar quality.

Geology and Soils

10.7.8 The soils in the area are classified as being slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. They have impeded drainage (i.e. a low leaching potential) and have a moderate fertility.

10.7.9 British Geological Survey (BGS) maps indicate that the superficial geology underlying the proposed Project Site is composed of Diamicton (Lowestoft Formation), while the underlying hard rock geology is characteristic of peat, sand and gravel and calcerous tufa. The Envirocheck report states that the bedrock geology is made up of Norwich Crag (previously Chillesford Clay), and Red Crag.

10.7.10 Norwich Crag is mainly unfossiliferous pale grey silty clay, with rare sand laminae. The deposit is bioturbated and burrowed. It locally contains shell debris. The deposit is thought to have formed on intertidal mudflats and is around 6 m thick. The formation unconformably overlies the Red Crag Formation. This is coarse-grained, poorly sorted, cross-bedded abundantly shelly sand. It is dark green and glauconitic when unoxidised, but typically oxidised to yellow or reddish brown with ferruginous concretions. Basal bed of rounded flint pebbles. Onshore it is commonly 20 m thick.

10.7.11 According to the BGS Lexicon the Lowestoft Formation is an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays. The till is characterised by chalk and flint content. The thickness of the till is extremely variable and is at its thickest in buried valleys it can be up to 60 m.

10.7.12 The bedrock of the proposed Project Site is classified as a Principal Aquifer. The aquifer has a very low vulnerability to pollutants given the low leaching potential of the soils overlying the Project Site. The superficial deposits at the Project Site are also unproductive strata with low permeability.

10.7.13 BGS maps indicate that the superficial and hard rock geology underlying the two Gas Connection options and the two Electrical Connection and Electrical Connection Compound options is the same as that underlying the Power Generation Plant.

Contamination

10.7.14 Historical landfill sites, licensed waste management facilities, local authority recorded landfill sites, registered waste transfer sites, registered treatment or disposal sites, control of major accident hazards sites, notifications of installations handling hazardous substances and planning hazardous substance consents are noted within the Envirocheck report.

10.7.15 Those listed in Table 10.6 are within the Project Site.

Table 10.6 - Potential sources of contamination within the Study Area (Envirocheck Report)

Number	Category	Details
1	Licensed Waste Management facilities	Name: Dowds C L Location: Langton Green, Eye Airfield, Eye, Suffolk, IP23 7HN Licence status: surrendered Site category: Metal recycling sites (vehicle dismantlers)
2	Notification of installations handling hazardous substances (NHHS)	Name: British Gas TransCo Location: Diss Compressor Station, Langton Green, Eye, Suffolk, IP23 7HL
3	Planning Hazardous Substances Consents	Name: British Gas Plc Location: Diss Compressor Station, Diss, Mid Suffolk, IP22 Status: consent was granted between June 1992 and November 1992 Hazardous substance: Part C, flammable substance (not in Parts A&B), gas or gases flammable in air, when held as a gas, where amount held is

		>15 tonnes

10.7.16 Key past and present developments in the vicinity of the proposed Project that could have had an impact on geology and ground contamination include:

- Former Eye Airfield runways and fuel storage facilities within the disused airfield;
- The existing 12.7 MW Eye Chicken Litter Power Plant located immediately to the north of the proposed Power Generation Plant site.

10.7.17 Due to the presence of the former Eye Airfield it is possible that unknown unexploded ordnances / munitions may be present. The likelihood of this occurrence is not known at this stage however this will be assessed further in the full ES.

10.8 Conceptual Site Model

10.8.1 Table 10.7 below, is a tabular representation of a CSM. The CSM is a representation of the potential pollutant linkages for the construction, operation and decommissioning of the proposed Project.

10.8.2 The table details that the potential sources of contamination on site include historical sources, off-site sources which could leach onto the site and existing contaminants of unknown composition which are already present.

10.8.3 Potential receptors include the soil and construction workers and potential pathways to these receptors include leaching in surface water, dermal contact and inhalation of airborne contaminants.

Table 10.7- Conceptual Site Model

Source	Potential Contaminants	Potential Pathways	Potential Receptors
Former Eye Airfield (historic source)	Unexploded ordnances Aviation fuel spillages	Leaching in surface water Dermal contact with contaminated soils Inhalation of airborne contaminated soil	Soils Construction workers Underlying Principal Aquifer
Chicken Litter Power Plant	Accidental spillages Leaching from stockpiled chicken waste		
Construction / decommissioning could lead to the mobilisation of unknown contaminants in the soil onsite	Unknown at this stage		
Installations listed within Table 10.6	Metals / Part C Hazardous Substances		

10.8.4 The table above is useful to show the potential pollutant linkages. However, it does not predict the likelihood of their occurrence. It is anticipated that there is a very minimal risk that any of the pathways listed in the table above will be created. This is explored in further detail below. The existing installations and the proposed Project are anticipated to incorporate best available techniques (BAT) with regards to contaminant containment therefore potential contaminants are unlikely to be leached into the soil. Existing unknown contaminants are unlikely to reach the principal aquifer via a preferential pathway provided by piled foundations as overlying the aquifer is unproductive strata of approximately 17 m in depth. The depths of any onsite piling will not reach 17 m. With regards to historic contamination due to the former Eye Airfield, it is anticipated that since the Airfield was decommissioned in the 1960s all unexploded ordnances will have been discovered and appropriately disposed of by this date, but this will be checked with the use on an unexploded ordinance survey to be included in the ES.

10.9 Preliminary Assessment of Potential Impacts

POWER GENERATION PLANT

Construction

10.9.2 During construction works, the main impact on ground conditions and from contamination arising from construction activities will be due to:

- Disturbance of existing contamination and the creation of pathways to receptors;
- Creation of pollution incidents through e.g. improperly maintained equipment;
- Loss of usable agricultural land; and
- Disturbance to or loss of important deposits of geology and soils.

10.9.3 When assessing the potential impacts relating to the construction of the Power Generation Plant, it has been assumed that several confirmed mitigation measures will be applied. These include: working in accordance with best practices, maintaining safe working practices and the use of correct and appropriate Personal Protective Equipment (PPE). The confirmed mitigation measures are assumed to be implemented at all times throughout the construction phase.

10.9.4 Accordingly, the confirmed mitigation measures will adhere to the following documents:

- Protection of Workers and the General Public during the Development of Contaminated Land (HSE, 1991); and
- A Guide to Safe Working on Contaminated Sites, R132 (CIRIA, 1996).

10.9.5 During construction, the existing soil conditions are not anticipated to negatively impact upon construction workers. Potential impacts to health (arising from oral, inhalation or dermal contact with potential contaminants in the soil) are negated by the implementation of the confirmed mitigation measures at all times.

10.9.6 Assuming the implementation of the above mitigation measures construction is considered to represent an impact of minor significance to human health.

10.9.7 The agricultural land is classed as provisional grade 3 i.e. good/moderate, therefore the Power Generation Plant will result in the sterilisation of up to 10 Ha of agricultural land within the Power Generation Plant site. It is important to note that ALCs are sweeping

classifications given to large areas therefore they may not necessarily accurate on a site-scale.

10.9.8 The construction of deep foundations (e.g. piled foundations on to bedrock) could offer a preferential pathway for contaminants to impact upon groundwater bodies beneath the Power Generation Plant Site. However, the depth of the bedrock which is classified as a principal aquifer is approximately 17 m based on BGS borehole logs from around the area of the Power Generation Plant site. As such, this is well below the depth of any foundations that will be required for the construction of the Power Generation Plant and thus the potential to create a pathway to the underlying Aquifer is considered negligible. As such, the impact on this aquifer is also considered negligible.

Operation

10.9.9 During operation there will be no further disruption to the underlying geology and soils of the Power Generation Site, although there will be permanent sterilisation of the agricultural land for the duration of the proposed Project's operational life.

Decommissioning

10.9.10 The impacts during decommissioning will be temporary and in line with those described above for construction.

10.9.11 The concrete foundations will likely be left in the ground after decommissioning of the Power Generation Plant and it is common for concrete foundations to remain in-situ for many years following decommissioning of sites. The environmental impact of this is predicted to be negligible as the foundations will be constructed of an appropriate grade of concrete to resist degradation from the soils and groundwater. The remaining ground will be reinstated back to its original condition (before the proposed Project was commissioned) with suitably clean topsoil and vegetation cover, where appropriate, and no significant residual impacts are anticipated.

GAS CONNECTION ROUTE CORRIDOR OPTION 1

Construction

10.9.12 Gas Connection Route Corridor Option 1 crosses developed land immediately south of the Diss Compressor Station. The land along which the connection will travel is typically flat and around 45 m AOD.

10.9.13 Potential sources of contamination arise from the presence of the Diss Compressor Station, where integrated pollution controls and integrated

pollution prevention controls are identified on Envirocheck mapping data at this location. The main activity listed within these controls is combustion. It is anticipated that the onsite combustion activities provide energy for the compression of natural gas for transport. It is anticipated that combustion at the Diss Compressor Station would have no impacts on the geology and soils in this area. Minimal impacts on soil may arise from the deposition of any airborne pollutants released by the combustion process.

10.9.14 The soils and underlying geology along this route corridor are the same as those identified below the Power Generation Plant site. However, this land is not used for agricultural purposes and thus there would be no loss of agricultural land as a result of this proposed Gas Connection option.

10.9.15 Furthermore, the depth of excavations for the construction of the Gas Connection is likely to be to a depth of approximately 1.5 m, well above the underlying groundwater aquifer. As such, with the use to best practice construction techniques, the risk of creating a pathway to this receptor is considered to be low and the impact is considered negligible.

10.9.16 There are not anticipated to be any impacts related to the geology along this Gas Connection Route Corridor Option 1. There will be temporary soil disturbance due to construction, however as the land is not used for agricultural purposes this will not result in any sterilisation.

Operation

10.9.17 As the Gas Connection would be a buried pipeline, once operational, the pipeline will have no impacts on the surrounding geology, ground conditions or agriculture.

10.9.18 There will be a permanent easement around the pipeline which would be expected to be approximately 10m wide, resulting in the permanent sterilisation of a narrow corridor around the field boundary.

10.9.19 As such, the findings of this preliminary assessment are that Gas Connection Route Corridor Option 1 would have negligible impacts on the geology and ground conditions.

Decommissioning

10.9.20 Following the decommissioning of the plant, it is anticipated that the Gas Connection pipe will be left in-situ, as removal of the pipe would cause more environmental disruption than leaving it in place

10.9.21 As such, the findings of this preliminary assessment are that Gas Connection Route Corridor Option 1 would have negligible impacts on the geology, ground conditions and agriculture of the area during decommissioning.

GAS CONNECTION ROUTE CORRIDOR OPTION 2

Construction

10.9.22 Gas Connection Route Corridor Option 2 would follow the edges of agricultural fields around the industrial estate and along the A140. This land is classified as grade 3 agricultural land which means it is of 'good to moderate quality'. The land along which the connection will travel is typically flat and around 45 m AOD.

10.9.23 There are no known potential sources of contamination at this location including for example hazardous substance discharge consents, authorised landfill or historic landfill sites.

10.9.24 The soils in the area are classified as being slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. They have impeded drainage (i.e. a low leaching potential) and have a moderate fertility.

10.9.25 British Geological Survey (BGS) maps indicate that the geology underlying the route is the same as that underlying the Power Generation Plant and Gas Connection Route Corridor Option 1 as described above.

10.9.26 As such, there are not anticipated to be any impacts related to the geology in respect of this option. However, there will be temporary soil disturbance due to construction of the Gas Connection leading to the temporary sterilisation of good to medium quality agricultural land across an approximately 30 – 50m wide corridor around the edge of the fields.

Operation

10.9.27 As the Gas Connection would be a buried pipeline, once operational, the pipeline will have no impacts on the surrounding geology or ground conditions.

10.9.28 There will be a permanent easement around the pipeline which would be expected to be approximately 10m wide, resulting in the permanent sterilisation of a narrow corridor around the field boundary.

10.9.29 As such, the findings of this preliminary assessment are that Gas Connection Route Corridor Option 2 would have negligible impacts on

the geology and ground conditions and moderate impacts on agriculture through the sterilisation of agricultural land during operation.

Decommissioning

10.9.30 Following the decommissioning of the plant, it is anticipated that the Gas Connection pipe will be left in-situ, as removal of the pipe would cause more environmental disruption than leaving it in place.

10.9.31 As such, the findings of this preliminary assessment are that Gas Connection Route Corridor Option 2 would have negligible impacts on the geology and ground conditions. Once the pipeline is decommissioned, the permanent easement is likely to be removed, meaning that the land sterilised during operation may be reinstated. As such, the decommissioning of Gas Connection Route Corridor Option 2 would have a negligible impact in agriculture.

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 1

Construction

10.9.32 The land along which the connection would lie and the Electrical Connection Compound would be located is typically flat agricultural land that is classified as grade 3 which means it is of 'good to moderate quality'.

10.9.33 Historical ordnance survey maps from the late 1800s onwards show that this area has been arable agricultural since this time, therefore there is little potential for ground contamination.

10.9.34 There are no known potential sources of contamination at this location including for example hazardous substance discharge consents, authorised landfill and historic landfill sites etc.

10.9.35 The soils in the area are classified as being slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. They have impeded drainage (i.e. a low leaching potential) and have a moderate fertility.

10.9.36 British Geological Survey (BGS) maps indicate that the geology underlying the route is the same as that underlying the Power Generation Plant and Gas Connection Route Corridors described above.

10.9.37 There are not anticipated to be any impacts related to the geology in respect of this option.. However, there will be temporary soil disturbance due to construction leading to the temporary sterilisation of

good to medium quality agricultural land along the length of the Electrical Connection Route Corridor and the area of the Electrical Connection Compound.

Operation

10.9.38 During operation there will be no further disruption to the underlying geology and soils of the site along the Electrical Connection Route Corridor, although there will be permanent sterilisation of the agricultural land upon which the Electrical Connection Compound is constructed, and along the access route which will likely follow the path of the connection for the duration of the projects operational life.

10.9.39 There will also be a permanent easement along the Electrical Connection which would be expected to be approximately 10m wide, resulting in the sterilisation of a narrow corridor around field boundaries (the exact route and impact to be confirmed and quantified in the ES).

10.9.40 As such, the findings of this preliminary assessment are that Electrical Connection Compound and Electrical Connection Option 1 would have negligible impacts on geology and ground conditions and moderate impacts on agriculture through the temporary sterilisation of agricultural land during operation.

Decommissioning

10.9.41 The impacts during decommissioning would likely be temporary and in line with those described above for construction.

10.9.42 The concrete foundations of the Electrical Connection Compound would likely be left in the ground after decommissioning and it is common for concrete foundations to remain in-situ for many years following decommissioning of sites. The environmental impact of this is predicted to be negligible as the foundations will be constructed of an appropriate grade of concrete to resist degradation from the soils and groundwater. The remaining ground will be reinstated back to its original condition (before the proposed Project was commissioned) with suitably clean topsoil and vegetation cover, where appropriate and no significant residual impacts are anticipated.

10.9.43 It is anticipated that the electrical cable would be left in-situ, as its removal would likely cause more environmental disruption than leaving it in place.

10.9.44 As such, the findings of this preliminary assessment are that decommissioning of Electrical Connection Compound and Electrical Connection Option 1 would have negligible impacts on the geology and

ground conditions of the area. Once the electrical cable was decommissioned, the permanent easement would likely to be removed, meaning that the land sterilised during operation may be reinstated. As such, its dimensioning would have a negligible impact in agriculture.

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 2

Construction, Operation and Decommissioning

10.9.45 Given the similar site conditions and similar length of the potential connection route, there are not anticipated to be any material differences between the impacts on geology, ground conditions and agriculture between Electrical Connection Compound and Electrical Connection Option 2 and those described above for Electrical Connection Compound and Electrical Connection Option 1.

10.10 Potential Mitigation / Measures Techniques

Power Generation Plant

Construction

10.10.2 The construction of the Power Generation Plant has the potential to create impacts relating to human health and groundwater quality. However, providing that the confirmed mitigation measures are adhered to, as well as more specific measures, as set out below, no significant impacts is anticipated.

10.10.3 During construction, mitigation measures would be covered by the Construction Environmental Management Plan (CEMP) which will apply to each of the key elements of the proposed Project. The CEMP will incorporate appropriate mitigation measures that will be approved by the relevant authorities and adopted, such that it would be unlikely that any impacts would arise during construction. The CEMP will be secured by a requirement attached to the DCO.

10.10.4 Embedded mitigation measures will include adherence to good practice guidelines and could involve, for example,

- Dust suppression measures;
- Any additional soil materials that are to be imported to the sites will be required to have certification of their chemical concentrations to ensure that contaminative materials are not being introduced to the area;

- In order to further limit disturbance, the site access tracks will be constructed first to allow movement of vehicles around the site on areas of soft-standing;
- Any vegetation, topsoil and subsoil will be removed to expose a suitable sub-grade. Any soils, sub-soils or aggregate suitable for reuse will be stockpiled on impermeable liners.
- Soils which are to be reused onsite will be tested for contamination and geotechnical suitability. This will form part of a site waste management plan (SWMP) which will be drafted prior to construction and will focus on the re-use, recycling and reduction of waste spoil.
- Surface water, perched waters or groundwater from dewatering operations will not be discharged to surface water or foul or surface water drains without the appropriate consents from the local water or sewage company and / or the EA.
- The disposal of this effluent will be the responsibility of the contractor. If necessary, this water will be tankered off-site for disposal at a suitable facility;
- All foundations will be appropriately specified to resist chemical attack from soils or groundwater; and
- Foundations will also be designed so as not to present a preferential pathway for contaminant migration, if present at the Power Generation Plant site.

10.10.5 Further, specific mitigation measures could include, for example, remediation of the site, removal of contamination hotspots or further site characterisation and will be determined during the EIA and set out in the ES to be submitted with the proposed DCO Application for the proposed Project.

Gas and Electrical Connections

10.10.6 Embedded mitigation measures for the Gas Connection, Electrical Connections, and Electrical Connection Compound are likely to be the same as for the Power Generation Plant.

Operation

10.10.7 As there will be no likely significant effects on the geology or soils at the site no mitigation measures are anticipated to be necessary during the operation of the proposed Project.

Decommissioning

10.10.8 A decommissioning plan will be prepared in compliance with best practice, 12 months prior to decommissioning, or as agreed with MSDC and the EA.

10.10.9 Mitigation measures implemented during decommissioning will be similar to those implemented during construction.

10.10.10 Dust suppression measures will be put in place to minimise dust generation on the site and surrounding environment.

10.10.11 Any soils, sub-soils or aggregate suitable for reuse will be stockpiled on impermeable liners. Any additional materials that are to be exported from the Project Site will be required to have certification of their chemical concentrations to ensure that contaminative materials are not being introduced to the area.

10.10.12 The Project Site will be reinstated (as far as is reasonably possible) to its former use. Clean topsoil and turf will be imported where necessary and the site will be re graded.

10.11 Preliminary Assessment of Residual Impacts

10.11.1 On the basis of the preliminary environmental information available to date and assessment described above, taking into account potential mitigation measures, there are not predicted to be likely significant effects on geology, ground conditions and agriculture as a result of the proposed Project. This position will be further assessed and confirmed in the ES.

SECTION 11

LANDSCAPE AND VISUAL IMPACT

11 LANDSCAPE AND VISUAL IMPACT

11.1 Introduction

11.1.1 This section of the PEIR presents the baseline and methodology for the preliminary assessment of potential landscape and visual impacts arising from the development of the proposed Project.

11.1.2 Some key features of the proposed Project have the potential to produce direct and indirect impacts on the landscape resource and on visual receptors during construction, operation and decommissioning. Effects on the landscape include physical changes to the landscape as well as changes to landscape character. Effects on the landscape may also include effects on areas designated for their scenic or landscape qualities at a national, regional or local policy level. Effects on visual amenity relate to changes to views, and the appearance and prominence of the development in those views.

11.1.3 The preliminary assessment has been prepared after a preliminary site visit covering the immediate surroundings and extending to approximately 10 km from the Project Site. Further site surveys for the full landscape and visual impact assessment (LVIA) for the ES to be submitted with the proposed DCO Application are being undertaken and will cover the study area as defined below.

11.1.4 The location of the Project Site and the LVIA study area is shown on Figure 11.1, Site Location and Study Area. Areas within the 15 km radius study area with minimum predicted visibility, i.e. where there is no likelihood of significant effects, including effects on landscape character types, designations, viewpoints, settlements or routes have been ‘scoped out’ of the assessment.

11.1.5 This section presents the status of the landscape and visual impact assessment for the proposed Project and includes:

- Relevant landscape planning policy and guidance;
- The assessment methodology proposed for the LVIA including the identification of specific sensitive receptors;
- Significance criteria;
- Embedded design mitigation;
- The existing baseline conditions against which the assessment will be made;
- An outline of potential impacts from the proposed Project;

- Potential mitigation of potential significant landscape and visual impacts;
- Residual Impacts following possible mitigation and
- The identification of further data-gathering and consultations required to complete this aspect of the Environmental Statement (ES)

11.2 Legislative and Policy Context

11.2.1 The following legislation, planning policy and planning guidance are relevant to landscape aspects of the Project:

Legislation

11.2.2 The European Landscape Convention became binding in 2007 and is the first international convention to focus specifically on landscape issues in order to protect, manage and plan landscapes in Europe. This has not resulted in any new UK legislation.

11.2.3 The Countryside and Rights of Way Act 2000 provides a statutory framework for statutorily protected landscapes and introduced an additional right of access requiring the identification of Open Access Land

National Policy Statements

11.2.4 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic landscape and visual impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

11.2.5 National policy seeks to protect and enhance environmental quality specifically for new energy infrastructure through NPS EN-1 and through EN-2, EN-4 and EN-5. EN-1 recognises that Nationally Significant Infrastructure Projects will have effects on the landscape and that the scale of such Projects means they will be visible within many miles of the site of the proposed infrastructure.

11.2.6 Section 5.9 of NPS EN-1, Landscape and Visual, requires, “The applicant’s assessment to include effects during construction of the

Project and the effects of the completed development and its operation on landscape components and character. The assessment should include the visibility and conspicuousness of the Project during construction and of the presence and operation of the Project and potential impacts on views and visual amenity. This should include light pollution effects, including on local amenity and nature conservation".

11.2.7 With regard to landscape impacts NPS EN-1 states, "Landscape effects depend on the existing character of the local landscape, its current quality, how highly it is valued and its capacity to accommodate change. All of these factors need to be considered in judging the impact of a Project on landscape. Virtually all Nationally Significant Infrastructure Projects will have effects on landscape. Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints the aim should be to minimise harm to the landscape, providing reasonable mitigation where possible and appropriate."

11.2.8 With reference to visual impact NPS EN-1 states, "All proposed energy infrastructure is likely to have visual effects for many receptors around proposed sites. The [Secretary of State] will have to judge whether the visual effects on sensitive receptors ….. outweigh the benefits of the Project. The [Secretary of State] should ensure applicants have taken into account the landscape and visual impacts of visible plumes from chimney stacks and / or cooling assembly".

11.2.9 Guidance is given in relation to mitigation, such as at paragraph 5.9.22 of NPS EN-1: "within a defined site, adverse landscape and visual effects may be minimised through appropriate siting of infrastructure within that site, design including colours and materials, and landscaping schemes, depending on the size and type of proposed Project. Materials and designs of buildings should always be given careful consideration."

11.2.10 At section 4.5 of NPS EN-1, and paragraph 2.3.16 of NPS EN-2, the importance of good design is set out in respect of landscape and visual (as well as other) considerations.

Other National and Local Policy

11.2.11 Whilst the PA 2008 is clear as to the primacy of the relevant NPSs, other national and local planning policy can be considered important and relevant by the Secretary of State in the determination of an energy NSIP.

11.2.12 Paragraph 56 of the NPPF states that, "The Government attaches great importance to the design of the built environment. Good design is a key

aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people."

11.2.13 The integration of new development into the existing landscape is noted in paragraph 61 of the NPPF which states, "Although visual appearance and the architecture of individual buildings are very important factors, securing high quality and inclusive design goes beyond aesthetic considerations. Therefore, planning policies and decisions should address the connections between people and places and the integration of new development into the natural, built and historic environment."

11.2.14 NPPF paragraph 109 requires the planning system to enhance the natural and local environment by, "protecting and enhancing valued landscapes, geological conservation interests and soils."

Local Plan Policies

11.2.15 As to local policy, the proposed Project site lies within the area covered by the MSDC LDF. Local planning documents contained in the LDF most relevant to the LVIA are the Core Strategy DPD (adopted September 2008) and the EADF. Core Strategy Objective SO 1, requires proposed development should protect, manage, enhance and restore landscape, biodiversity and geodiversity of the District. Core Strategy Policy CS5 Mid Suffolk's Environment, states, "All development will maintain and enhance the environment, including the historic environment, and retain the local distinctiveness of the area". Specifically in respect of landscape the policy states, "The Council will protect and conserve landscape qualities taking into account the natural environment and the historical dimension of the landscape as a whole rather than concentrating solely on selected areas, protecting the District's most important components and encourage development that is consistent with conserving its overall character".

Local Guidance Documents

11.2.16 The MSDC emerging EADF (February 2013), whilst not formally adopted as a LDF document, comprises several documents that provide detailed guidance and up to date contextual information for many aspects of the design and siting of development. With reference to landscape character assessment (at paragraph 3.8) it states, "the SCC (SCC) landscape character assessment has informed our initial site analysis and the development brief recommendation that the development should be landscape-led for this particular environment, so that the wider area's character integrity can be maintained and enhanced in new development". (bold in original document).

11.2.17 The EADF Landscape Appraisal and Strategy Document (2162-D10_C) provides several recommendations that should be taken into consideration in new development. Specifically, it advises developers, “Advance planting of the structural belts is part of the strategy so that the mitigation of development is effective at an earlier time, and in certain areas there would also be a restriction on building heights”.

11.2.18 Drawing number 2162/D10, titled Landscape Strategy, illustrates where structure planting would be required throughout Eye Airfield. With regard to the proposed site (Development Area 8), linear woodland and shelter belt planting is proposed to reinforce landscape character and provide new wildlife habitats along the northern, southern and western boundaries.

11.2.19 EADF document, Draft Baseline Landscape Appraisal, Lloydbore Ltd (December 2011), provides further guidance to protect the landscape and visual qualities of the airfield in the context of potential future development through design codes. The following design codes are relevant to the proposed development:

- Paragraph 6.17 notes the former airstrips are unique and significant historical features that should be retained and emphasised by green structure including hedgerows, tree belts and surface water attenuation. This guidance would apply to the southern and western boundaries of the development site, which adjoin two former airstrips.
- Paragraphs 6.20 - 6.21 note the potential prominence of chimneys, flues and other tall vertical elements on the skyline, and the need for sensitive planning, siting and design to reduce adverse impact on the landscape and its visual qualities. Design issues concerning the colour, finishes, orientation and scale of new industrial structures should be designed to minimise landscape impact. Consideration should be given to the use of recessive colours and matt finishes that would be less eye catching and less prominent in the landscape.
- Paragraph 6.22 notes the planning authority’s requirement for a landscape and visual assessment to be undertaken in accordance with current best practice to support proposed development of this type.

11.2.20 SCC’s advice note ‘Planting New Woodlands Protecting Archaeology & Landscape Character’ provides guidance for the design of woodland planting in order to protect landscape character, historic landscape features and archaeological sites.

11.3 Project Scenario for Assessment

11.3.1 In respect of landscape and visual effects, the realistic worst case scenario from within the proposed project parameters (which are described in Section 3 of the PEIR) are set out in Table 11.1 below.

11.3.2 The reason that the parameters identified in Table 11.1 represent the realistic worst case in relation to landscape and visual effects are:

- Larger stack heights increase the likelihood of visual impact; and
- Greater number of stacks increases the likelihood of visual impact.

11.3.3 A preliminary assessment of both options for the Gas Connection, Electrical Connection and Electrical Connection Compound is presented in this section.

Table 11.1 - Worst case parameters for the proposed project considered within this assessment

Parameters	Details
Power Generation Plant	
Number of gas turbine units	5 (~ 59 MWe)
Number of stacks	5
Height of Stack	30m
Unit type	Aero derivative

11.4 Assessment Methodology and Significance Criteria

The Scope of the Assessment

11.4.2 The purpose of the LVIA is to describe and evaluate separately potential landscape and visual effects that would arise from the proposed Project. It is an iterative process; and for the purpose of this assessment, impacts that are assessed as being either moderately adverse or beneficial or above are considered significant in terms of the EIA Regulations. Although slight adverse or beneficial and neutral impacts would not be considered significant, they remain worthy of consideration throughout both the design and the decision making process.

11.4.3 This assessment describes and evaluates the existing landscape and visual amenity, identifying future changes without the proposed Project, and assessing potential impacts arising during the construction,

operation and decommissioning stages. It considers impacts in relation to:

- Landscape character and resources, including effects on the aesthetic values of the landscape caused by changes in the elements, characteristics, character and qualities of the landscape;
- Designated landscapes, registered parks and gardens, and recreational interests;
- Visual amenity, including effects upon potential viewers and viewing groups caused by changes in the appearance of the landscape as a result of the proposed Project; and
- Cumulative effects arising in combination with those developments with planning permission but not yet constructed and those developments submitted for planning permission but which have not been granted planning permission.

11.4.4 Landscape character and associated resources are considered to be of importance in their own right and are valued for their intrinsic qualities irrespective of whether they are seen by people. Impacts on visual amenity as perceived by people, are therefore clearly distinguished from, although closely linked to, impacts on landscape character. Landscape and visual assessments are therefore separate although linked processes.

11.4.5 The sequence of the LVIA will be as follows:

Baseline Studies
Landscape context
Landscape receptors and sensitivity
Visual composition, receptors and sensitivity
↓
Landscape and Visual Impact Assessment
Potential impacts arising from the development
Mitigation
Evaluation of significance of landscape effects
Evaluation of significance of visual effects
Appraisal of compliance with planning policy
Assessment of cumulative effects
Conclusions

Spatial Scope

11.4.6 The spatial scope of the preliminary assessment extends 15 km in radius from the centre of the proposed Power Generation Plant site where the tallest structures will be located. It is shown on Figure 11.1, Site Location and Study Area. A separate ZTV will be produced for the Electrical Connection Compound after the location has been finalised. The study area will be extended if theoretical views of the Electrical Connection Compound are available beyond the 15 km study area.

11.4.7 The study area is broken down and impacts addressed as follows:

- 0 to 5 km radius area (inner study area) selected for assessment of impacts on landscape character at a local level, designated landscapes, landscape features and visual amenity.
- 5 to 15 km study area (outer study area) selected for broader assessment of impacts on landscape character with reference to National Character Areas (NCAs). Impacts on visual amenity will also be addressed.

Temporal Scope

11.4.8 Detailed site studies are being undertaken between June 2013 and January 2014 to establish the landscape and visual baseline. The results of those studies already undertaken have fed into this PEIR. Landscape and visual impacts will be assessed for the construction phase, at operation, and at decommissioning. Visual impacts will be

assessed for the winter situation when the screening effect of vegetation will be least effective.

Guidance

11.4.9 The methodology for the assessment is based on current best practice and guidance from the following sources:

11.4.10 Guidelines for Landscape and Visual Impact Assessment (GLVIA), third edition, published by the Landscape Institute & Institute of Environmental Management and Assessment (2013);

11.4.11 Landscape Character Assessment Guidance for England and Scotland (LCAG), published by Scottish Natural Heritage (2002) and the Countryside Agency; and

11.4.12 Advice Note 01/11: Photography and Photomontage in Landscape and Visual Impact Assessment, Landscape Institute (2011).

11.4.13 Whilst this assessment methodology follows best practice outlined in the guidance above, the assessment also takes account of some limited definition of the height, size and positioning of proposed buildings and structures. As explained in section 3, the 'Rochdale approach' is used, and this considers the worst or maximum case scenario in terms of the size and scale of the proposed Project subject to landscape and visual impact assessment.

Baseline Studies

11.4.14 Baseline information is being collected from the following sources:

11.4.15 Published landscape character assessments at national, regional and local scale;

11.4.16 Ordnance survey maps to identify public rights of way as well as landform, drainage, field settlement and transport patterns;

- Aerial photographs (where available);
- Site survey; and
- Statutory and non-statutory websites

Methodology to Establish Landscape Baseline

11.4.17 The baseline study provides an understanding of the landscape in the area that may be affected. It includes a description of landscape's constituent elements, its character and the way this varies spatially, its

geographical extent, its condition and the way the landscape is experienced, and the value attached to it.

11.4.18 Landscape character is what makes an area unique. It is defined by Natural England, "Landscape is more than just 'the view'. It is about the complex, interacting natural and cultural systems that make up each landscape and it is also about the relationship between people, place and nature" (www.naturalengland.org.uk/ourwork/landscape).

11.4.19 The essential components of landscape character are:

- A distinct and recognisable pattern of elements. Landscape elements are the dominant features which characterise, contribute to or detract from the overall landscape impression, i.e. the built form, the landform, land use, vegetation, water, field patterns, walls etc. They are quantifiable and can be described; and
- Landscape Type: These are identifiable at the broader scale and are understood in terms of areas with a homogeneous character based on geology, topography, geomorphology, vegetation and / or land use or dominant elements, e.g. moorland, rolling upland, historic parkland, urban. These are elements or groups of elements, which can be classified as a landscape type of a particular quality and value. Sensory experiences, e.g. tranquillity and wildness, are also considered as part of the overall make up of the character type.

11.4.20 The quality and sensitivity of the baseline landscape is being assessed and categorised in accordance with the criteria shown in Table 11.2. The capacity of the landscape to accept development is reflected in the degree to which it is able to accommodate change (due to a particular development or land use change) without adverse effects on its character. Landscapes that have the highest sensitivity to change usually have the lowest capacity to accept change. Sensitivity is not absolute; it will vary according to the character of the existing landscape and the extent and nature of the proposed Project.

11.4.21 Quality relates to the physical state of the landscape and its intactness from visual, functional and ecological perspectives. It also reflects the state of repair of individual features and elements that make up the character in any one place.

11.4.22 The sensitivity of a landscape to change varies according to the nature of the existing resource and the nature of the proposed change. Considerations of value, integrity and capacity are all relevant when assessing sensitivity.

11.4.23 Value relates to the value or importance attached to a landscape for its scenic or aesthetic qualities or cultural associations. It may be recognised through national, regional or local designations.

11.4.24 Integrity is the degree to which the value and condition has been retained.

Methodology to Establish Visual Baseline

11.4.25 The visual baseline establishes the extent of the area in which the development would be visible, the different groups of people who would experience views of it (receptors), the places where they would be affected, and the nature of the views and visual amenity at those points.

11.4.26 A Zone of Theoretical Visibility (ZTV) map will be prepared for a 15 km radius from the centre of the Power Generation Plant where the tallest, most visible structures would be located. They will indicate the areas where views of the proposed buildings or stacks would theoretically be available. A separate ZTV will be produced for the Electrical Connection Compound after its location has been finalised, and the study area will be extended if it indicates theoretical views of the Electrical Connection Compound beyond the 15km study area.

11.4.27 The ZTVs will be computer-generated using intervisibility software with Ordnance Survey DTM and models of the proposed buildings up to 20 m high and stacks up to 30 m high. The ZTVs indicate where views of the structures are available theoretically. They do not take account of the screening effect of surface features, including minor landform, woodlands, and hedgerows and built development, and as such present the ‘worst case’ scenario.

11.4.28 The visual assessment considers viewpoints from locations throughout the study area that are representative of potential views from residential properties, public rights of way, recreational resources and heritage assets. They will be selected in consultation with MSDC, Babergh District Council (BDC) and South Norfolk Council (SNC).

11.4.29 Visual receptors, such as users of buildings, recreational spaces, footpaths and transport routes, have differing sensitivities to their visual environment. Generally, this is dependent upon their interest in the visual environment, their viewing opportunity and duration, and the context of the views. These factors may be expressed in terms of:

11.4.30 The value of the view / viewpoint reflects the intrinsic character and scenic qualities of its location and context. Where recognised through the designation of an area, such as a National Park or Area of

Outstanding Natural Beauty, value is increased, while the presence of detracting features in a view will generally reduce value. Higher value views/viewpoints are likely to be more sensitive to change

11.4.31 The importance of the viewpoint – as indicated by some form of recognition, e.g. as noted in a guidebook, marked on a map or indicated on the ground by a sign or other visible feature. The provision of facilities e.g. seating, parking, footpath may also indicate a location of higher importance. Views gained from locations where people gather outdoors may also be of higher importance

11.4.32 Viewers' expectations, occupations and activities when experiencing the view.

11.4.33 The sensitivity of visual receptors is set out in Table 11.2 Sensitivity of Receptors.

Table 11.2 - Sensitivity of Receptors

Sensitivity	Landscape Receptors	Visual Receptors
High	Important / highly valued landscape recognised by national or regional designation; Sense of tranquillity or remoteness noted in Landscape Character Assessment (LCA); High sensitivity to disturbance specifically noted in LCA; and The qualities for which the landscape is valued are in good condition, with a clearly apparent and distinctive character. This distinctive character is susceptible to relatively small changes	Viewers' attention likely to be focused on the landscape or have proprietary/high interest in their everyday visual environment and/or with prolonged and regular viewing opportunities. Such receptors would include: Residents experiencing views from dwellings. Users of public rights of way and access land Strategic recreational footpath and cycleways People experiencing views from important landscape features of physical, cultural or historic interest, beauty spots and picnic areas Large number of viewers and/or location in highly valued landscape could elevate viewer sensitivity to

Sensitivity	Landscape Receptors	Visual Receptors
		highest level.
Medium	Landscape of moderately valued characteristics reasonably tolerant of changes; Landscape is not recognised by national or regional designation; The landscape is relatively intact, with a distinctive character. and The landscape is reasonably tolerant of change.	Viewers with moderate interest in their environment, and discontinuous and/or irregular viewing periods. Such receptors would include: Road or rail users Users engaged in outdoor sport or recreation other than appreciation of the landscape (i.e., hunting, shooting, golf, water-based activities) Users of secondary footpaths or footpaths that may be already impacted by intrusive features.
Low	Relatively degraded or low value landscape with no designations; Landscape integrity is low, with a landscape in poor condition and a degraded character; and The landscape has potential capacity to accommodate significant change.	Small number or low sensitivity of viewers assumed. Viewers with a passing interest in their surroundings and momentary viewing periods. Such receptors include: Drivers/travellers and/or passengers of moving vehicles including trains. People at their place of work, including agricultural workers and other non-motorised users on most roads or those already impacted by intrusive features.

Methodology to Determine Magnitude of Effects

11.4.34 Consideration is given to the potential effects of the proposed Project, with mitigation, on landscape character and resources, and on visual amenity during the construction, operation and decommissioning phases. The assessment will distinguish between impacts on landscape character and those associated with visual amenity and views across the Project Site. Effects can be direct, indirect, cumulative, permanent (i.e. operational) or temporary (often associated with the construction phase) and are defined below.

- **Direct impacts** are those imposed on landscape elements on the site as a direct result of development, such as the loss of existing trees or other vegetation;
- **Indirect and secondary impacts** may occur some distance from the site, e.g. removal of screen vegetation on the site would allow views in from surrounding areas;
- **Cumulative impacts** occur when additional developments of similar type appear in an area or when a development might impose several different impacts on the same resource or receptor;
- **Short Medium or Long Term** describes the duration of an impact; and
- **Permanent or Temporary** relates for example to additional impacts during construction compared to the permanent change caused by the new Development.

11.4.35 The assessment considers whether effects would be adverse, beneficial or neutral. Generally, proposals that fit with the scale and character of the receiving landscape are more likely to be beneficial. In some situations effects may be adverse initially until mitigation planting achieves its design objectives, after which the effects become beneficial.

11.4.36 The magnitude of effect on landscape receptors is assessed in relation to the size or scale of effect, the geographical location of the area influenced and its duration and reversibility.

11.4.37 The assessment considers the magnitude of change the proposed Project would exert on the landscape because of:

- The proximity of the proposed Project to the landscape receptor – generally the magnitude of effect reduces with increasing distance as it exerts progressively less influence on the landscape;
- The extent to which the structures can be seen, and the extent to which landform, woodland, buildings etc. intervene; and

- The extent to which a landscape receptor would experience visibility of the structures and their resulting effects on character.

11.4.38 Criteria used to assess the magnitude of predicted landscape effects range from high through to negligible / no change and are set out below in Table 11.3 Magnitude of Change.

Table 11.3 - Magnitude of Change

Magnitude	Landscape Effects	Visual Effects
Major	Total permanent / long term loss or substantial change to key landscape features or elements of the baseline that are important to character resulting from the proposed development; The proposed development lies within or close to highly sensitive landscape; and Size of structures is out of scale with existing elements.	Major permanent / long term change in the existing view, change very apparent and dominant involving high level of change in character and composition of baseline, i.e. pre-development view.
Moderate	The proposed development forms a visible and recognisable feature in the landscape; Proposed development is some distance from highly sensitive landscape; Notable partial permanent / long term loss or alteration to one or more key landscape features or elements of the baseline that are important to character resulting from the proposed development; Other built elements or human activities in views; and The scale of the development fits with existing features.	Medium permanent / long term change in the existing view, change apparent involving change in character and composition of baseline, i.e. pre-development view.
Minor	Changes to the physical landscape, its character and the perception of the landscape are slight or short term; The proposed development is a long distance from highly sensitive landscape; and Effect reduced by the presence of many other built elements or human activities in views;	Minor permanent / long term change in baseline, i.e. pre-development view, - change will be distinguishable but not prominent from the surroundings, whilst composition and character of view, although altered will be broadly similar to pre-change circumstances.
Negligible	The effect of change on the perception of the landscape, the physical landscape or landscape character resulting from the proposed development is minimal. Very minor permanent / long term loss or	Very minor permanent / long term change in the existing view- change barely distinguishable from surroundings.

	change to one or more key landscape features or elements of the baseline that are important to character.	Character and composition of view substantially unaltered.
No Change	No changes, either positive or negative, would be perceptible.	No changes, either positive or negative, would be perceptible.

Methodology to Assess Significance of Landscape and Visual Effects

11.4.39 The GLVIA identifies a higher level of significance is generally attached to large scale effects and effects on sensitive or high-value receptors; thus small effects on highly sensitive sites can be more important than large effects on less sensitive sites.

11.4.40 The GLVIA provides the following general guidance when judging the significance of effects on the landscape:

- Loss of mature or diverse landscape elements, or features;
- Effects on character areas, which are distinctive or representative;
- Greater weight should be given to those elements, features and areas if they are identified as being of high value or importance, i.e. effects on those recognised as being of national importance are likely to be of more significance than effects on those of local importance;
- Landscapes of high value and sensitivity to the type of change proposed are likely to be more seriously affected by development than those with a lower sensitivity; and
- A test of significance is not directly related to planning policy.

11.4.41 The significance of an effect may be beneficial but more usually it will be adverse, at least initially. Significance has been determined using informed and well-reasoned professional judgment. The two principal criteria determining significance are the sensitivity of the receptor to change of the nature proposed by the development, and the magnitude of the effect. By combining the sensitivity of the receptor with the predicted magnitude of change, the level of significance is established as shown in the matrix in Table 11.4 Significance of Landscape and Visual Effect below. The matrix is not intended to be a prescriptive tool and judgements are made based on professional evaluation. Table 11.5 Significance of Effects describes the extent potential changes that would arise.

11.4.42 Generic Significance Criteria have not been applied to this assessment, and criteria derived from the GLVIA and other landscape guidance has

been used instead. The criteria in Table 11.4 have been applied because they describe the types of landscape or visual impact that would occur at each level of significance. For the purpose of this assessment, impacts that are assessed as being either moderately adverse or above are considered significant. Although slight adverse or beneficial and neutral impacts are not considered significant, they remain worthy of consideration throughout both the design and the decision making process. Significance of effect also needs to be qualified with respect to the scale or extent over which it is experienced. An effect may be locally significant, or significant with respect to a small number of receptors, but not significant when judged within a wider context.

Table 11.4 - Significance of Landscape or Visual Effects

		Magnitude of Effect				
		Major	**Moderate**	**Minor**	**Negligible**	**No Change**
Landscape and Visual Sensitivity	**High**	Very Large/ Large	Large / Moderate	Moderate	Slight	Neutral
	Medium	Large	Moderate	Slight / Moderate	Slight / Neutral	Neutral
	Low	Moderate	Moderate / Slight	Slight / Neutral	Slight / Neutral	Neutral

Table 11.5 - Definition of Significance of Effects

Significance	Landscape Effects	Visual Effects
Very Large	The proposed Development would result in effects that: Are at a complete variance with the landform, scale and pattern of the landscape; Would permanently degrade, diminish or destroy the integrity of valued characteristic features, elements and/or their setting; Would cause a very high quality landscape to be permanently changed and its quality diminished; and Will be substantially damaging to a high quality landscape.	The Development would cause a very significant deterioration in the existing view. The view would be completely lost on a permanent/ very long term basis. The visual, aesthetic and perceptual qualities would be very substantial altered in detriment to the special qualities/ key characteristics of the landscape and its amenity.
Large	The proposed Development would: Be out of scale with the landscape or at odds with the local pattern and landform; and Will leave an adverse impact on a landscape of nationally recognised quality.	The Development would cause a significant deterioration in the existing view. The view would be partially lost on a permanent/ very long term basis. The visual, aesthetic and perceptual qualities would be significantly altered in detriment to the special qualities/ key characteristics of the landscape and its amenity.
Moderate	The proposed Development would: Not quite fit into the landform and scale of the landscape; and affect an area of recognised landscape character.	The Development would cause a noticeable deterioration in the existing view. The view would be partially impacted upon. The visual, aesthetic and perceptual qualities would be changed/ altered affecting the special qualities/ key characteristics of the landscape and its amenity.
Slight	Slight or minor change affecting the character of the	The Development would cause a barely perceptible

	landscape or the elements therein.	deterioration in the existing view.
Neutral	No perceptible change affecting the character of the landscape or the elements therein. Includes, 'no effect'.	No discernible deterioration or change in the existing view. Includes, 'no effect'.

Visual Assessment Methodology

11.4.43 The magnitude of change upon visual amenity resulting from a development varies according to the following factors:

- The scale of change in the view with respect to the loss and/or addition of new features;
- The degree of contrast, or integration of / compatibility with any new features with existing features in the view;
- The duration of the effect (temporary or permanent, intermittent or continuous) (temporary effects are considered to be less significant than longer term or permanent effects);
- The distance of the receptor from the source of the effect;
- The angle of view and presence of intervening vegetation or features;
- The dominance of the impact feature in the view, and
- Seasonal variation.

11.4.44 This assessment assumes that the change would be seen in clear visibility and under appropriate lighting conditions and considers:

- The attributes of the landscape where the development would be sited. i.e. the scale and character of the landscape in which they would be viewed; the presence or absence of landscape features; and the scale / enclosure of the landscape within the field of view;
- The design and siting of structures within the development; and
- The atmospheric conditions prevalent at the time of viewing.

11.4.45 The magnitude of visual effects at any given distance will vary according to a range of factors, including:

- the number and proportion of stack(s) / plant buildings visible and their arrangement in the view
- the presence of other features in the view that draw the eye; and

- the extent to which views of the turbines from the viewpoint in question are obstructed or filtered by intervening landform, vegetation, or built structures.

11.4.46 It is assumed that the visual effects of the proposed Project will reduce as viewing distance increases. The magnitude of visual effects at any given distance will vary according to the range of factors described. Table 11.3 Magnitude of Change describes differing degrees of effect on visual amenity.

11.4.47 The significance of potential effects on visual amenity will be determined through the same process as landscape effects. The matrix set out in Table 11.4 considers both the magnitude of change and the sensitivity of the receptor to the proposed change (Table 11.2 & Table 11.3) and the significance of effect is defined in Table 11.5).

Illustrative Tools

11.4.48 The graphic information described below will be provided in the ES to illustrate visual aspects of the development. To date, a number of photomontages have been produced to accompany the PEIR, presented in Figures 11.6 – 11.9, and are described later in this section.

Zone of Theoretical Visibility Maps (ZTV)

11.4.49 Separate computer generated ZTV maps will be produced for the main structures and the stacks to assist in viewpoint selection and to appreciate the potential influence of the proposed Project in the wider landscape. For the purposes of this report an initial assessment of the areas from which the proposals are likely to be available are outlined.

11.4.50 The ZTVs will indicate areas from which it might be possible to secure views to part or parts of the proposed Project. However, use of ZTV mapping needs to be qualified on the following basis:

11.4.51 There are a number of areas within the ZTV maps from where there is potential to view parts of the proposal, but which comprise land where the general public do not have access;

11.4.52 A ZTV map does not account for the effects of screening and filtering of views as a result of intervening features, such as buildings, trees and hedgerows; and

11.4.53 A ZTV map does not account for the likely orientation of a viewer – for example when travelling in a vehicle.

11.4.54 The combined effect of these limitations means that ZTV mapping tends to over-estimate the extent of visibility – both in terms of the land area from which the proposed Project is visible and the extent of visibility of the structures from a particular viewpoint.

11.4.55 The use of this type of ZTV map is considered good practice and should be considered as a tool to assist in assessing the visibility of the proposed Project. A ZTV map does not present an absolute measure of visibility and does not represent the "visual impact" of the proposed development.

11.4.56 The ZTVs will be compiled using Ordnance Survey Landform Profile data comprising spot heights and contours (within a 10 m resolution) to produce a Digital Terrain Model. The DTM will be overlaid on a 1:50,000 Ordnance Survey base map to provide details of locations and landmark features, which may affect the extent of visibility or provide screening in the landscape. It will be produced using appropriate modelling software.

11.4.57 The ZTVs will be calculated using landform data, the proposed layout of the development, height options (buildings or stack), the centre of the ZTV, the radius from the proposed site centre, the resolution of the final output, the view height of the receptor, and the resolution of the landform data. For greater accuracy a calculation was built into the model to make corrections for the curvature of the earth.

Photographs and Panoramas

11.4.58 Photograph and panorama images have been produced to illustrate an observer's view of the existing site and proposed Project from each of the viewpoint locations agreed with SCC and other regulatory authorities. The images will be produced in accordance with best practice guidance described in the Advice Note 01/11, 'Photography and Photomontage in Landscape and Visual Impact Assessment' published by the Landscape Institute.

11.4.59 All photographs are taken with a Digital SLR camera, with 50 mm equivalent focal length lens (when compared to 35 mm film camera), mounted on a level panoramic head tripod. They record a 90 degree angle of view to illustrate the full extent of the proposed Project within the local landscape that would be experienced at each viewpoint. The photographs are then merged to create a panorama using photo-stitching software (Canon Photo Stitch) and the resulting digital photographic data will be used to produce the photomontages using appropriate software.

Photomontages and Visualisations

11.4.60 Three preliminary photomontages are provided to illustrate representative views from nearby locations. Each figure includes a wireframe outline and rendered image of the proposed Power Generation Plant.

Cumulative Assessment

11.4.61 The assessment will consider the cumulative impacts arising in combination with those developments with planning permission but not yet constructed and those developments submitted for planning permission but which have not been granted planning permission. Schemes will be identified in consultation with MSDC and SCC.

11.4.62 Preliminary cumulative impacts are described in Section 16 of this PEIR.

11.5 Embedded Design Mitigation

11.5.1 The proposed Project would be designed from the outset to ensure its impacts are minimised. This includes mitigation that is embedded into the design of the Power Generation Plant, Gas Connection, Electrical Connection and Electrical Connection Compound and industry standard methods and procedures to ensure impacts from construction, operation and decommissioning are minimised. In respect of landscape and visual effects this mitigation includes:

- The utilisation of a technology (SCGT) that allows a significant reduction in stack height in comparison to other technology types.
- Locating the Electrical Connection Compound within an area that can economically be reached by underground cable, thus removing the need to introduce overhead cables into the landscape.

11.5.2 The assessment in this Section considers such design mitigation. Any additional mitigation developed in response to specific impacts identified in this assessment is described in section 11.9 below.

11.6 Consultation

11.6.1 Preliminary consultation was undertaken with both SCC and MSDC concerning the location of viewpoints.

11.6.2 The Scoping Report for the proposed Project outlined in broad terms the approach to the landscape and visual assessment. Table 11.6 below details the Scoping Opinion provided by the Planning Inspectorate, dated 26 June 2013 and the responses received from

consultees in response to the Scoping Report together with responses made to PINS.

Table 11.6 - Consultation

Source	Consultee Comment	Response
THE PLANNING INSPECTORATE		
The Scoping Opinion (dated 26 June 2013) Paragraphs 3.46 – 3.54	All landscape planning designations, landscape character areas and potentially sensitive receptors should be identified using the most up to date policy documents	This is addressed at a high level in this PEIR and a more detailed review will be addressed in the ES
	The LVIA will include the methodology for the Zone of Theoretical Visibility (ZTV) and will ensure the area covered includes all potential sensitive receptors.	To be addressed in ES. For the purposes of this report an initial assessment of the areas from which the proposals are likely to be available are outlined.
	All parameters for the proposed structures and stacks should be supplied and the assessment based on the worst case scenario.	This PEIR makes a preliminary assessment based on the realistic worst case, which will be carried through and supplemented in the final ES following more assessment work.
	Consideration is to be given to the form and siting of large structures, and to the use of material and colours to minimise adverse visual impact, including in night time views	To be addressed in ES
	Photomontages and wireframes should be provided to illustrate representative day and night time views prior to development, upon completion and at an agreed future date when mitigation measures are fully established. The location and timing of viewpoints, photographs and visualisations should be agreed with relevant local authorities.	Three preliminary photomontages have been produced for the PEIR (Figures 11.6 – 11.8). Further montages will be produced for the ES when foliage cover is reduced later in the Autumn.

Source	Consultee Comment	Response
	The LVIA should consider the historic development of the landscape and cross reference made to the Cultural Heritage / Archaeology section of the Environmental Statement	Baseline historic landscape character is described briefly in this PEIR with reference to the Suffolk landscape character assessment and will be addressed further in the ES.
BROME AND OAKLEY PARISH COUNCIL		
Letter from Brome and Oakley Parish Council in PINS Scoping Opinion (dated 28 May 2013)	Visual impact assessment to include the plant itself and associated structures, e.g. electricity pylons, smoke stacks and high level structures	All elements of the Power Generation Plant and other above ground elements, such as the Gas AGI and Substation, will be included in the ES. The proposed Project will not require any additional electricity pylons so there is no need to address these in the PEIR or ES.
	Details of proposed mitigation planting to include species, types, sizes at planting, quantities etc.	To be addressed in the concept mitigation plan accompanying the proposed DCO Application
	Views to be assessed at Trees (part of Brome village west of the A140)	This location will be considered in the ES and may be included in the viewpoint visual impact assessment
ENGLISH HERITAGE		
Letter from English Heritage in PINS Scoping Opinion (dated 13 June 2013)	The LVIA should consider the historic development of the landscape and the role it plays in the wider setting of heritage assets and should inform the Cultural Heritage/ Archaeology section of the Environmental Statement.	Baseline historic landscape character is described briefly in this PEIR with reference to the Suffolk landscape character assessment. Assessment of L&V effects on heritage assets to be addressed in the ES.

Source	Consultee Comment	Response
		Refer also to the Cultural Heritage and Archaeology chapter of the PEIR and ES.
EYE TOWN COUNCIL		
Letter from Eye Town Council in PINS Scoping Opinion (dated 11 June 2013)	The visual impact assessment should cover a wider area than shown in the Scoping Report to include the A140 north of Dickleburgh, and roads to Thornham, Gislingham, Occold, and Hoxne / Stradbroke B1117.	All points raised are being addressed in the L&V assessment. These locations will be considered further in the ES and may be included in the viewpoint visual impact assessment following further consultation with local planning authorities.
PLACE DIRECTORATE (MSDC AND BABERGH DISTRICT COUNCIL)		
Letter from Place Directorate (MSDC and Babergh District Council) in PINS Scoping Opinion (dated 14 June 2013)	Further consultation regarding the selection of viewpoints is to be undertaken with both authorities and South Norfolk Council The LVIA will comply with Guidelines for Landscape and Visual Impact Assessment, Third edition, published by the Landscape Institute and Institute of Environmental Management and Assessment, 2013	Further consultation will be undertaken with all applicable local planning authorities prior to undertaking the ES LVIA Confirmed, this is a reference document used for this PEIR and for the ES.
NATURAL ENGLAND		
Letter from Natural England in PINS Scoping Opinion (dated 11 June 2013), Section 3. Landscape Character	Robust landscape character and visual appraisal required as the basis for the assessment. The LVIA shall comply with Guidelines for Landscape and Visual Impact Assessment, Third edition, published by the Landscape Institute and Institute of Environmental Management and	All points raised will be addressed in the ES using all relevant reference documents

Source	Consultee Comment	Response
	Assessment, 2013.	
	The location, scale, massing and selection of materials are to be considered in relation to local character and distinctiveness.	This PEIR makes a preliminary assessment based on the realistic worst case, which will be carried through and supplemented in the final ES following more assessment work
	Evidence of appraisal of other site layout options is to be provided with justification for the selected option in terms of landscape impact and benefit.	This PEIR makes a preliminary assessment based on the realistic worst case, which will be carried through and supplemented in the final ES following more assessment work
	The cumulative impact assessment shall consider relevant existing or proposed developments including those at Scoping stage.	Cumulative effects will be addressed in the ES, although this PEIR has carried out a preliminary cumulative assessment.
	The assessment will identify all land that is of outstanding scenic, scientific or historic interest within the study area.	HM Revenue & Customs website was consulted and no tax-exempt heritage assets were listed within the 15 km study area
NORFOLK COUNTY COUNCIL		
Norfolk County Council response in PINS Scoping Opinion (dated June 2013)	Landscape and visual impacts shall be assessed within Norfolk county where they fall within the zone of visual influence	This PEIR makes a preliminary assessment based on the realistic worst case, which will be carried through and supplemented in the final ES following more assessment work

Source	Consultee Comment	Response
	Photomontages shall be provided to illustrate the impact of the development	Further consultation will be undertaken with all local planning authorities prior to undertaking the ES LVIA to confirm viewpoints and illustrative materials to be provided
	Cumulative impacts are to be assessed	Cumulative effects will be addressed in the ES, although this PEIR has carried out a preliminary cumulative assessment.
	Impacts of the development on heritage landscape are to be assessed	Baseline historic landscape character is described briefly in this PEIR with reference to the Suffolk landscape character assessment. Assessment of L&V effects on heritage assets to be addressed in the ES. Refer also to the Cultural Heritage and Archaeology chapter of the PEIR and ES.
	Landscape impacts arising from upgrading existing roads to serve the proposed Project are to be assessed and mitigated where necessary	To the extent there are any such upgrades, these will be addressed in ES
	Effects on tourism are to be considered if the natural landscape is altered sufficiently.	To be addressed in ES
SUFFOLK COUNTY COUNCIL		
Letter from SCC in PINS Scoping Opinion (dated 13 June 2013)	Future development in adjacent areas of Eye Airfield are to be considered when developing landscape mitigation for the Project	Further development in the area will be considered when devising the mitigation proposals.
	Where practical mitigation shall provide multiple	To be addressed in the ES in order to

Source	Consultee Comment	Response
	benefits	meet landscape, visual, biodiversity and cultural heritage objectives
	The topic study area shall be extended to include the visual envelope of the tallest structures including the Dove valley. It shall consider the impact of the proposed stacks in combination with other stacks, masts and turbines	LVIA study area will extend over a 15 km radius from the centre of the site which includes the Dove valley
	The assessment shall take account of the Suffolk and South Norfolk landscape characterisations	This PEIR makes a preliminary assessment based on the realistic worst case, which will be carried through and supplemented in the final ES following more assessment work
	Further consultation regarding the selection of viewpoints is to be undertaken with MSDC and South Norfolk Council	Further consultation will be undertaken with all local planning authorities prior to undertaking the ES LVIA
	Planting constraints arsing from the grid connections are to be identified.	To be addressed in the concept landscape mitigation plan
	Where feasible underground services should be constructed using trenchless engineering techniques	To be addressed in the development of the design and mitigation proposals.
	Landscape and visual impacts arising from tall structures associated with the grid connection are to be assessed during construction and operation	All components of the proposed Project are being assessed.
YAXLEY PARISH COUNCIL AND THRANDESTON PARISH COUNCIL		
Joint Consultation	Visual impacts are to be assessed from Mellis,	These locations will be considered in

Source	Consultee Comment	Response
Response from Yaxley Parish Council and Thrandeston Parish Council in PINS Scoping Opinion (dated 13 June 2013)	Thrandeston, Eye, Palgrave and Hoxne and areas of high ground. They shall include specifically Dukes Bridge in Yaxley, the pond/Little Green in Thrandeston, Goswold Hall and Maltings Farm	consultations with the local planning authorities and may be included in the viewpoint visual impact assessment in the ES.
	A visual assessment shall be undertaken during the winter when screening from vegetation is least effective	To be addressed in ES
	Consideration is to be given to the arrangement of the structures by height to achieve a 'smoothed' profile	Such a smoothed profile is unlikely to be technically achievable, due to the requirements of the power plant layout. Furthermore, the profile will be different from different viewing points. None the less, consideration of the plant layout will be made to ensure the least visually intrusive design is taken forward (within the bounds of what is technically achievable).
	Details of landscape mitigation are to be provided and shown on photomontages	Preliminary embedded mitigation is described at 1.5 and secondary landscape mitigation at section 1.9 in this PEIR. The landscape mitigation strategy will be developed in consultation with the planning authority and addressed in ES.
	The effects of the electricity substation further west are to be assessed	This PEIR makes a preliminary assessment based on both options for the Electrical Connection and Electrical Connection Compound, which will be

Source	Consultee Comment	Response
		carried through and supplemented in the final ES following more assessment work.

11.7 Baseline Conditions and Receptors

11.7.1 This preliminary report contains the baseline data regarding landscape and visual amenity. .

Landscape Context

11.7.2 Information regarding baseline landscape features is shown on Figure 11.2, Landscape Context.

Statutory designations

11.7.3 There are no nationally designated landscapes within the 15 km study area.

11.7.4 Several villages within the study area include land, which is registered as a village green under section 15 of the Commons Act 2006. The following Village Greens lie within close proximity to the Project Site, some of which also lie within conservation areas:

- Far Green, Diss: 5 km north west
- Park Fields, Diss: 5 km north west
- The Village Green, Palgrave: 4.7 km north west
- Lower Street Green, Hoxne: 5 km north east

11.7.5 Registered Common Land sites within 5 km of the Project Site include:

- Stuston Common: 3.4 km north
- Little Green, Thrandeston: 3 km north east
- The Marsh, near Thrandeston: 3.1 km north east
- Mellis Common, Mellis: 3 km west

11.7.6 Several areas of Open Access land lie within 5 km of the Project Site and coincide with common land at Stuston and village greens at Mellis, Wortham and Thrandeston.

Non-statutory designations

11.7.7 MSDC has designated a number of locally important Special Landscape Areas (SLA), including:

- River Dove, which runs south-west to north-east on the eastern side of the study area
- River Waveney, which runs west to east across the northern part of the study area

11.7.8 Further SLAs close to the development site include Burgate, Thornham Park / Mellis Common, Mellis, Thornham Magna, Wortham, Hoxne – Low Street and Eye.

11.7.9 In addition, as illustrated on Figure 11.2 Landscape Context, Edmundsbury Borough Council has designated Waveney River Valley as a SLA. SNC also identifies the Waveney River Valley as a locally important landscape.

11.7.10 Visually Important Open Spaces, many of which are also Village Greens, near to Eye Airfield include Eye, Yaxley, Mellis, Thrandeston, Thornham Magna, Hoxne and Stuston. They are considered worthy of protection for their characteristic 'openness' as grassed areas, village greens or gardens or by the presence of natural features such as trees, hedges, shrubs or ponds that make them an important part of the local scene.

Biodiversity

11.7.11 Biodiversity issues are covered in Section 7. No Sites of Nature Conservation Interest, SSSI, National Nature Reserves, Local Nature reserves or RAMSAR Sites lie within or adjacent to the proposed development site that would influence landscape mitigation proposals.

11.7.12 No Ancient or Semi-Natural Woodland lies within Eye Airfield Industrial Estate. The following are the closest areas to the Project Site:

- Duchess Wood, Thornham Parva: 4.5 km south west
- Burgate Wood: 6km west

Historic Landscape Features

11.7.13 Section 13 addresses issues in relation to heritage assets.

11.7.14 Scheduled Ancient Monuments (SAMs) are described in Section 13. A viewpoint at Eye Castle SAM, which lies within 2 km of the Project Site, will be included in the ES visual assessment. The remains of the motte and bailey castle at Eye are approximately 57 m in diameter and 12 m high from where there are long distance views in all directions.

11.7.15 No English Heritage Registered Parks and Gardens exist within the 15 km study area. The following non-registered Parks and Gardens are listed on the Historic Parks and Gardens website:

- Thornham Hall, Thornham Magna: 3.8 km south west. The formal gardens, which extend over 10 ha, were established in 1840. Glasshouses that were constructed at this time were restored in the

1990s when the walled garden was redesigned by Peter Thoday as a walled orchard for training people with disabilities. The wider estate extends over 830 ha and includes extensive woodlands with approximately 12 mi of way marked footpaths.

- Chandos Lodge, Eye: 1.5 km south east. The garden to Chandos Lodge was first created at the beginning of the 19th century and modified in the mid-20th century by others and specifically by Sir Frederick Ashton. The gardens now include remnants of an orangery, a pond, a small 20th century folly, and a serpentine boundary wall leading to Lambseth Street.
- The Abbey, Eye: 2.4 km south east. The gardens formed part of the grounds surrounding the Priory of St Peter, founded in 1080. The Abbey now includes a landscaped garden with herbaceous borders and beds around the remains of the Priory, two glasshouses and a short length of 'crinkle crankle' wall. The archaeological remains comprise mounds and some standing structures conserved within the garden; the original monastic walk around the church is still visible as a sunken path.

11.7.16 Conservation areas lying in close proximity to the Project Site include:

- The centre of Eye; 2 km south east. A large urban conservation area focused on the historic core of the medieval town and centred on the parish church and castle. Views of the former Eye Airfield are constrained by the densely packed townscape and abundant mature trees. Views into and out of the conservation area are restricted by dense mature planting that fringes much of the town, especially on the north and west side.
- Scole; 4.5 km north east. A small rural conservation area centred on the historic core of the village, which comprises a linear settlement along the old Norwich Road. Views into and out of the conservation area to the south and west are limited by mature tree planting on the edge of the village.
- Mellis; 4 km west. A large rural conservation area focused on the extensive linear open green space of Mellis Green and Common. The conservation area is bisected towards the eastern end by the railway line. Mellis Common is visually contained on the north and south side by a combination of loose grained development and extensive belts of mature trees. Views into and out of the conservation area are limited by extensive groups of mature trees. The conservation area boundary follows the widening of the common at its eastern end, with some more open views towards the east.

- Thrandeston; 3 km north west. A small rural conservation area centred on the historic core of the village and containing several listed buildings and other historic properties on the eastern edge of the conservation area. It is fringed by several mature trees that limit views into and out of the area.
- Hoxne Low Street; 5 km north east. A small rural conservation area centred on the historic core of the village. It is characterised by the elongated triangular village green that runs north to south, rising towards its northern end and is visually enclosed on the east and west sides by tightly packed historic buildings. Views into and out of the conservation area are limited by dense tree planting, especially on the south and west sides.
- Hoxne Cross Street; 5 km north east. A small rural conservation area covering the small loose grained settlement to the south of the main village of Hoxne. It is characterised by its linear form focused on Abbey Hill and Cross Street, which run roughly north to south. Views into and out of the conservation area are limited by mature trees.
- Diss; 5 km north west. A large urban conservation area covering the core of the historic town and centred on 'The Mere', a lake of over 2 ha. It also includes large enclosed public and private open spaces that are a characteristic feature of the town.
- Palgrave; 4 km north west. A small rural conservation area centred on the historic core of the village with the village green and parish church of St Peter at its centre. The core of the conservation area is characterised by The Green, which is aligned north to south and visually enclosed by buildings on the east and west sides. Views into and out of the conservation area are restricted by mature planting that surrounds much of the village.

11.7.17 SCC's Historic Environment Record describes Eye Airfield as a 2nd World War airfield, originally part of an American families Cornwall estate. It was constructed in 1942 for use as a military airfield until 1945 and remained in civilian use until 1962. Features of historic interest include the runways, a lych gate and 2 T2 type hangars.

11.7.18 The EADF, section 2.9 notes that although the airfield has not been the subject of systematic archaeological investigation, metal detected finds to the south in the vicinity of the application site indicate Roman and Anglo-Saxon and medieval occupation (HER no. YAX 032).

Public Rights of Way

11.7.19 A well developed network of PRoWs lies within the inner study area. Some local footpaths appear to have been re-routed along the

boundary of the airfield at the time of its construction and operation. They include a public footpath between the A140 and Mid Suffolk Business Park that follows the southern end of the western boundary and the southern boundary of the proposed Project site. The A140 road, which lies close to the western boundary of the airfield, presents a hazard to pedestrians crossing it.

11.7.20 The Mid Suffolk Footpath is a long distance recreational trail extending over 32 km between Hoxne in the north and Stowmarket in the south. Several short circular walks exist within the overall route, including Eye. The route lies within 2 km at its closest point to the Project Site.

11.7.21 Other long distance recreational trails within the 15 km study area include:

- Angles Way Footpath, which runs west to east in the northern part of the study area and within 4.2 km at its closest point to the Project Site
- Boudica's Way Footpath, which runs west to north-east in the northern part of the study area and lies within 4.3 km at its closest point to the Project Site
- Middy Railway Footpath, which runs south-west to north east in the southern part of the study area and lies within 9.5 km at its closest point to the Project Site

11.7.22 Two Sustrans Regional Cycle Routes (RCR) lie within the 15 km study area:

- RCR 30: 2 Rivers Lowestoft to Kings Lynn via Diss follows Castleton Way, which forms the southern boundary of the Eye Airfield site.
- RCR 40: Cycling in the Heart of Suffolk lies to the east of the Project Site.

Land of outstanding scenic, historic and scientific interest

11.7.23 No land designated by Natural England for its outstanding scenic, historic and scientific interest (Inheritance Act 1984) lies within the 15 km study area.

The site and surrounding area

11.7.24 Eye Airfield is a redundant WWII airfield, which lies approximately 2 km north west of the small town of Eye roughly halfway between Norwich and Ipswich in north Suffolk. The area in the immediate vicinity of the site comprises medium to large scale industrial development within the

former airfield (Eye Airfield Industrial Estate and Mid Suffolk Business Park), and is surrounded by semi-rural landscape that includes arable farmland, the A140 major transport route, prominent pylons and an overhead transmission line from Sizewell nuclear power station, and small villages / farmsteads.

11.7.25 The airfield occupies an area of approximately 250 ha. Several parts of the industrial estate are fully developed with e.g. wind turbines, various industrial units, a chicken litter biomass power station with 40 m high stack, and a National Grid Gas Compressor Station with communications mast, which are sited in the northern part of the industrial estate. Generally taller development has been located centrally in the northern part of the airfield with lower development on the more visible outer areas in the north east and north west. Much of the southern part of the area proposed for industrial development is in agricultural use

11.7.26 Suffolk HER (EYE 072) lists remnant features of the former airfield, which includes wide concrete runways, a lych gate, two T2-type hangars and a Nissan hut. The runways and undeveloped site are used for various recreational activities including walking, flying model aircraft and taxiways for informal car club meetings.

11.7.27 The site and wider industrial estate are relatively flat and ground levels vary between approximately 45 m AOD (metres above Ordnance Datum) in the centre of the site to 40 m AOD at the lowest point in the south east. The highest point of the site is 49 m AOD, west of the national grid compression station. Changes in level throughout the Eye Airfield Industrial Estate are barely perceptible.

11.7.28 Mature tree belts and hedgerows with hedgerow trees within Eye Airfield Industrial Estate reduce views of existing industrial development; the degree of screening provided by predominantly deciduous vegetation is reduced following leaf fall.

11.7.29 The small medieval town of Eye lies approximately 1.8 km south east of the Project Site. The topography of Eye has kept the shape of the medieval form of the old town quite distinct. Its name translates to ‘island’, all around are water meadows on the River Dove and tributaries, which have prevented concentric or radial growth of the town. Modern residential development is concentrated on the northern and western edges of the town.

Landscape Character

11.7.30 The baseline landscape character is described with reference to the following landscape character assessment data available at national, regional and local level:

- Countryside Character Volume 6: East of England, National Character Area 83: South Norfolk and High Suffolk Claylands and National Character Area 85: Breckland, by Countryside Agency (now Natural England), 1998;
- Suffolk Landscape Character Assessment, by SCC (in partnership with Living Landscapes Project and all District and Borough Councils in Suffolk), 2008;
- South Norfolk Landscape Character Assessment, by Land Use Consultants, published by South Norfolk District Council, 2006; and
- Eye Airfield Draft Baseline Landscape Appraisal, by Lloydbore Ltd, 2011.

11.7.31 National, regional and local landscape character areas are illustrated in Figure 11.3 Landscape Character.

National Character Area 83 South Norfolk and High Suffolk Claylands

11.7.32 National Character Area 83: South Norfolk and High Suffolk Claylands is described as, “above all, farming country with strong utilitarian and traditional character, evoked best in its churches, moated farmhouses and irregular field patterns and hedgerow oaks. It is a controlled and balanced landscape for the most part although there are some areas in which the loss of hedgerows and the amalgamation of fields into prairies give a bleak and denuded character to the landscape”.

11.7.33 Key characteristics include:

- Large area of chalky boulder clay plateau with little relief, except where incised by small rivers and streams and the river Waveney;
- Slightly undulating topography;
- Area of relatively small, individual landholdings, with scattered small parkland estates. Mix of remnant medieval Ancient Countryside (irregular small fields with pollard hedgerow oaks), early co-axial field patterns (east of Scole) and large modern fields devoid of hedges and trees;
- Large number of isolated, moated timber-framed farmhouses, mainly 1400 – 1730, with steeply pitched pantile or pegtile roofs.

Little flint, some brick (especially in towns). Small villages and nucleated market towns with architectural variety and colour;

- Almost entirely arable, except for pasture in river valleys, remnant parkland, common and greens. Intensive livestock housing (pig / poultry);
- Boundaries formed by deep ditches, with or without hedges / hedgerow trees. Ponds are few. Large areas of woodland are scarce, especially on plateau. Small copses are frequent in some areas; and
- Few major transport routes but an extensive network of narrow lanes and byroads.

11.7.34 Under 'The Changing Countryside' the NCA notes the following changes that have altered the landscape within the study area:

- "Continuing but now isolated loss of hedgerows and hedgerow trees due to amalgamation of small fields and over-zealous mechanical hedgerow management;
- Loss of ditches, ponds and pasture (especially in High Suffolk) due to field amalgamation and improved drainage techniques;
- In recent years, two Sizewell nuclear power stations have been constructed and deliver electricity via huge pylons which still dominate the landscape and are impossible to ignore in the flattish terrain; and
- Development pressure is focused almost entirely on towns well-served by transport systems, as in the A14 corridor and along railway routes, which often have modern housing estates grafted on to small market towns. This has the additional effects of gentrification of houses, barn conversions and creeping suburbanization."

11.7.35 Under 'Shaping the Future' the NCA suggests the following measures to protect its distinctive landscape character:

- "The historic and visual value of hedgerow oaks (including pollards) and remnant hedgerows in maintaining historic field patterns should be recognised and their retention or replanting should be addressed;
- The creation and management of small to medium-sized woods should be considered on the plateaux edges and in areas adjacent to existing woods; and

- The retention of commons, greens, roadside verges, trees on perimeter banks and hedge lines, and ponds would help to conserve the character of the area."

National Character Area 85 Breckland

11.7.36 A small area on the north western edge of the study area lies within NCA 85: Breckland. Key characteristics of this area include:

- "Distinctive large-scale landscape of pale coloured arable fields or open heath contrasting with vertical elements of pine lines, belts or forestry;
- Unique combination of underlying rocks and soils with slightly undulating dry terrain contrasting with shallow, wooded river valleys;
- Long history of settlement but now very sparsely populated, with nucleated villages within river valleys; and
- Open arable landscape with long views interrupted by belts and plantations of Scots and Corsican Pine."

11.7.37 With reference to the Suffolk Landscape Character Assessment, the following landscape character areas exist within the study area.

Suffolk Character Area - Ancient Plateau Claylands

11.7.38 The Project Site is located within the Ancient Plateau Claylands. Its key characteristics are:

- Flat or gently rolling arable landscape of clay soils dissected by small river valleys;
- Field pattern of ancient enclosure – random patterns in the south but often co-axial in the north. Small patches of straight-edged field associated with the late enclosure of woods and greens;
- Dispersed settlement pattern of loosely clustered villages, hamlets and isolated farmsteads of medieval origin;
- Villages often associated with medieval greens or tyes;
- Farmstead buildings are predominantly timber-framed, the houses colour-washed and the barns blackened with tar. Roofs are frequently tiles, though thatched houses can be locally significant;
- Scattered ancient woodland parcels containing a mix of oak, lime, cherry, hazel, hornbeam, ash and holly;
- Hedges of hawthorn and elm with oak, ash and field maple as hedgerow trees;

- Substantial open areas created for WWII airfields and by 20th century agricultural changes; and
- Network of winding lanes and paths often associated with hedges create visual intimacy."

11.7.39 Under 'Landscape Sensitivity & Change' it notes:

- "The characteristic land cover is arable farmland divided by an irregular sinuous field pattern, and scattered woodland. There are important areas of regular fields, created by the enclosure of commons greens and tyes, as well as a distinctive pattern of co-axial fields in the north western portion of this landscape type, "the Saints" area. All these historic field patterns are degraded in many places by boundary rationalisation. There are also occasional landscape parks, for example at Thornham Magna, Ringsfield and Flixton. However, parklands in this landscape are not as ubiquitous and extensive as in the Ancient estate Claylands; and
- Former WWII airfields are a recurring feature of this landscape. They are often the focus of industrial and transport orientated development, as well as the construction of large-scale wind turbines, all of which can have considerable local visual impact."

11.7.40 Under 'Development Management' it notes the following with respect to the development of former airfield sites:

- "In most cases a specific master-plan approach is the most effective way to deal with the development of these sites. It is then possible to implement strategic planting schemes to mitigate visual impact of long-term growth on the site, rather than dealing with proposals and mitigation on a piecemeal basis; and
- Specific issues relating to airfield development also include the preservation of cultural and historic features, such as bunkers and control towers, and the need for a design that retains them in an appropriate setting. Also, the alignment of runways etc can be echoed in the layout of buildings and the arrangement of planting."

11.7.41 Under 'Visual Experience' it states, "On the more extensive plateau areas to the north of the Gipping the views are frequently open, though with some woodland present in the views. Occasionally there can even be a feeling of exposure. To the south there is a stronger feeling of enclosure with big hedges supplementing the ancient woods to give the landscape distinctly 'woodland' feel."

11.7.42 Under 'Condition' it notes localised impacts of development occur in association with former airfield sites such as Eye. Although agricultural intensification in the 20th century has led to the removal of hedgerows, and a thinning out of the historical field pattern the distinctive character

of this landscape remains. Overall, the qualities for which this landscape is valued are in good condition, with a clearly apparent and distinctive character. This distinctive character is relatively susceptible to relatively small changes and is assessed to be of High sensitivity.

Suffolk Character Area - Rolling Valley Claylands

11.7.43 The key characteristics of this area are:

- "Gently sloping valleys on medium clay soils;
- Occasional notable steeper slopes;
- Fields often smaller than on surrounding plateau;
- Localised influence of landscape parks;
- Focus of settlement;
- Few large greens or commons; and
- Ancient woodland on the upper fringes of the valley sides."

11.7.44 Intrusive development on valley sides has caused adverse change within some areas of this relatively tranquil landscape. Much of the landscape is in good condition, it is relatively intact and has a distinctive character, and therefore is assessed to be of Medium / High sensitivity.

Suffolk Character Area - Plateau Claylands

11.7.45 The key characteristics of this area, which extends over much of the southern part of the study area include:

- Plateau of heavy clay soil very gently undulating or flat dissected by small streams;
- Ancient organic pattern of fields, some co-axial in the north east;
- Substantial hedges of hawthorn, blackthorn and elm with oak and ash predominant hedgerow trees;
- Extensive areas of hedgerow loss creating "arable prairies";
- Large modern agricultural buildings a recurrent feature;
- Redundant WWII airfields; and
- Almost no woodland.
- A working landscape on which suburbanisation is only beginning to make an impact compared with other parts of the country.

11.7.46 Although much of the landscape is in good condition, the pattern has been degraded in areas with consequent loss of distinctive character, and it is assessed to be of Medium sensitivity.

Suffolk Character Area - Rolling Valley Farmlands and Furze

11.7.47 The key characteristics of this area, which lies in a narrow band to the north of the application site, include:

- Valleys with prominent river terraces of sandy soil;
- Small areas of gorse heathland in a clayland setting;
- Straight boundaries associated with late enclosure;
- Co-axial field systems;
- Mixed hedgerows of hawthorn, dogwood and blackthorn with oak, ash and field maple;
- Fragmentary cover of woodland;
- Sand and gravel extraction;
- Golf courses; and
- Focus for larger settlements.

11.7.48 This landscape is relatively intact with a distinctive character and is assessed to be of Medium sensitivity.

11.7.49 With reference to the South Norfolk Landscape Character Assessment, the following landscape character areas exist within the study area.

South Norfolk Character Area - Rural River Valley

11.7.50 The key characteristics of this area, which lies in a narrow band to the north of the study area, include:

- Distinct valley landform with wide long flat valley floodplains;
- Semi-enclosed landscape with long internal and restricted external views;
- Presence of watercourse clearly visible as a river, although often invisible within the wider landscape;
- Areas of unenclosed ‘wild’ fenland;
- Pasture and wet woodland within valley base;
- Predominantly wooded valley slopes;
- Sparse settlement within the valley bases; and
- Strong sense of tranquillity and rural isolation

11.7.51 The qualities for which this landscape is valued are in good condition, with a clearly apparent and distinctive character, which is susceptible to relatively small changes. It is assessed to be of High sensitivity.

South Norfolk Character Area - Tributary Farmland

11.7.52 The key characteristics of this area, which lies to the north of the study area, include:

- Shelving and gently undulating landform created by small tributary valleys;
- Transitional landscape between the upland plateaux and the river valleys;
- Occasional long views;
- Dispersed but evenly distributed settlement pattern;
- Network of winding rural lanes bound by banks or ditches; and
- Medium to large scale arable farmland with remnants of parkland.

11.7.53 The landscape is relatively intact with a distinctive character. It is assessed to be of Medium sensitivity.

South Norfolk Character Area - Plateau Farmland

11.7.54 The key characteristics of this area, which lies on the northern edge of the study area, include:

- Distinctive flat and elevated landform;
- Large arable fields of monoculture;
- Strong sense of openness and exposure due to lack of enclosing elements;
- Wooded horizons;
- Presence of tall structures which interrupt the sense of openness; and
- Sparsely settled landscape mostly comprising small nucleated and long linear settlements.

11.7.55 The landscape character and pattern has been degraded by arable monoculture and it is assessed to be of Low sensitivity.

11.7.56 Landscape Character Assessment provided in the Eye Airfield Draft Baseline Landscape Appraisal provides a detailed analysis of landscape character variations throughout the airfield. Figure 11.4 is an extract from this report; the application site lies in landscape character area C Industrial / Agricultural.

11.7.57 It notes the following key features which are considered worthy of retention and / or enhancement:

- "Remnant field boundary hedgerows, trees and ditches;
- 'Heroic' scale structures along the western site boundary redolent of aircraft hangar architecture;
- Long views to the south;
- Dramatic broad, flat runways of some historic / cultural significance;
- Attractive tree-lined approach to Eye from the north, along the B1077; and
- Broad open grass verge along the A140 providing a setting for the large scale industrial units beyond."

11.7.58 It notes key elements that detract from the character of the site are:

- "Eroded / discontinuous boundary hedgerows and degraded landscape structure;
- Industrial units / sheds of poorer visual quality; and
- Lack of consistent branding / signage."

11.7.59 The proposed Project site lies within landscape character area C – Industrial / Agricultural, and the key characteristics of this area are:

- "Contained arable fields, bounded by industrial plots and (northern part) residential development;
- In general, views are restricted by large buildings such as the industrial and freight buildings within Eye Airfield;
- Remnant concrete runway strips alongside the arable fields;
- Sparse boundary vegetation, opportunity for improvement; and
- Little topographical variation."

11.7.60 It assesses the overall sensitivity of this landscape to be Low due to a lack of local distinctiveness and the presence of incongruous landscape elements, and notes there is great potential for enhancement.

11.7.61 Landscape character areas to the south of and adjoining area C – Industrial / Agricultural include areas A – Agricultural, F– Rural land and G – Eye setting and all three areas are of the highest sensitivity. Landscape adjoining the western boundary of the site is of Low – Negligible sensitivity and to the north and east is of Negligible sensitivity.

Baseline Visual Amenity

11.7.62 ZTVs will be produced for the proposed Project which will inform the landscape and visual impact assessment. They will show the extent of

theoretical visibility of the structures and stacks within the study area, and will extend over a 15 km radius from the centre of the Project Site.

11.7.63 For the purposes of this report an initial assessment of the areas from which the proposals are likely to be available are outlined. In preparation for the ES, viewpoints will be selected for visual impact assessment from Table 11.7 below, and which are shown in Figure 11.5. This preliminary list was informed by the Eye Airfield Development Framework and developed in consultation with MSDC in June 2013. Further consultation regarding the location of viewpoints and presentation of illustrative materials (photographs, wireframes and photomontages) will be undertaken with Place Directorate (MSDC and BDC) and SNC.

11.7.64 A preliminary site survey was undertaken in June 2013 where it was found that views were not available from other locations that were suggested by MSDC. They included Palgrave, Billingford, Thornham Magna, Thornham Park, Wortham, Snape Hill and Gislingham. As the screening was partly attributable to woodland and hedgerows, a winter visual survey will be undertaken to revisit these locations and establish the full extent of views available when screening from vegetation is least effective.

11.7.65 Figure 11.5, Viewpoint Locations, shows the location of proposed viewpoints detailed in Table 11.7. Their selection was based on the criteria that viewpoints should:

- Be representative of the likely impacts;
- Show a range of different types of views;
- Represent selected heritage assets referred to in this ES chapter;
- Be representative of different receptor groups ;
- Be representative of the varying image of the proposed development in the landscape; and
- Be accessible from public vantage points.

11.7.66 However, it should be noted that this is a preliminary list and may be amended following consultation with MSDC, NSC and BDC

Table 11.7 - Baseline Viewpoint Locations

Receptors: H = residential; R = recreational; T = road user or worker; C = cultural heritage

Sensitivity: H = High, M = Medium, L = Low

Viewpoint No.	Location	Grid Ref. Easting, Northing	Distance / direction	Receptor / sensitivity
VP1	Eye Castle (SM), Eye	614786, 273798	2.1km SE	C – H H – H R – H
VP2	B1077, Victoria Hill, Eye	614363, 274519	1.3km E, SE	H – H T – M
VP3	Allotments and PRoW, off Gay Crescent, Eye	613894, 274339	1.1km SE	H – H R – H
VP4	Iron Gates, Langton Green Mid Suffolk Footpath	614200, 275038	1.2km E	H – H R – H T – M
VP5	Rectory Road, Brome	614311, 276482	1.7km NW	H – H R – H T – M
VP6	Gissing Farm, Cock's Road, South Green	617020, 275245	3.8km E	H – H R – H T – M
VP7	Cock's Road, Cranley Green Road, Cranley	615738, 272873	1.6km S,SE	H – H T – M
VP8	Occold Hall, Castle Hill (B1077), Occold	614890, 270275	2.4km S, SE	H – H R – H T – M
VP9	Eye Road (B1077), PRoW, Thorndon Hill	615079, 272750	5.8km S, SE	H – H R – H T – M
VP10	The Auberge, A140 / B1117 junction, Thornham Parva	611268, 272215	3.2km S, SW	H – H T – M
VP11	Hall Farm, PRoW, Yaxley	612335, 273351	1.6km S	H – H R – H T – M

Viewpoint No.	Location	Grid Ref. Easting, Northing	Distance / direction	Receptor / sensitivity
VP12	Whitehouse Farm, Old Norwich Road, Mellis	612165, 274280	1.1km S, SW	H – H T – M
VP13	Open Access land Mellis Road, Mellis	610385, 274693	2.6km W	H – H R – H T – M
VP14	PRoW, Thrandeston	611857, 276208	1.6km NW	H – H R – H T – M
VP15	Home Farm, Trees Brome	613136, 276310	1.2km N	H – H T – M
VP16	Old Bury Road, Stuston Common, Stuston	612579, 278113	3.1km N	H – H R – H T – M

11.7.67 The EADF notes the visual sensitivities of the airfield, as it states that "Eye Airfield is a complex site, in which areas of intensively developed employment land contrast with open agricultural land; rural lanes contrast with busy trunk roads; there is an array of land uses and architectural styles; an unique historical connection largely expressed by concrete runways; and a network of public rights of way crossing the site." It identifies several viewpoints with the highest visual sensitivity to future development within the application site, which is represented by viewpoints VP1 – VP4 and VP 12 to VP15 in Table 11.7.

11.7.68 Potential visibility of the proposed Project from the north would be experienced by highly sensitive receptors occupying properties in parts of Brome, Trees, Thrandeston, Palgrave, Stuston and Scole, and by walkers using PRoWs including Angles Way and Mid Suffolk Footpath long distance trails. It is likely that views would be available from the edges of these settlements nearest to the proposed Project. Views from within these settlements in this predominantly flat landscape would be substantially limited by buildings, garden vegetation and field boundary hedges/ hedgerow trees and small woodlands. From these locations existing views of industrial development at Eye Airfield are extensively screened by vegetation in the vicinity of the airfield except for views of industrial units adjacent to the B1077. Views of taller structures including the chicken litter power plant stack and wind turbine rotor blades are visible over intervening vegetation.

11.7.69 Further north, between the B1118 road and Scole, the landform falls gently within the broad, shallow Waveney Valley and views of Eye Airfield from the SLA are limited by the nature of the valley landform and intervening woodland.

11.7.70 Potential visibility of the proposed Project from the east would be experienced by highly sensitive residential receptors at Langton Green, South Green, scattered farmsteads, and by walkers using PRoWs including Mid Suffolk Footpath along Brome Avenue. Views of the Mid Suffolk Business Park are substantially screened by woodland leaving the chicken litter factory chimney, National Grid Gas Compressor Station mast, and wind turbines prominent on the skyline.

11.7.71 Further east land falls away to the shallow Dove Valley SLA between Eye and Oakley Park. Views of Eye Airfield are substantially screened by the valley landform and intervening woodland.

11.7.72 Several highly sensitive visual receptors exist in close proximity to the southern edge of Eye Airfield which includes residents on the north western edge of Eye, Eye Parish Church tower (landmark), Eye Castle (SAM), Castleton Way, residents at Yaxley and Thornham Hall and Thornham Parva, allotments at Eye, and an extensive network of local PRoWs. Land slopes southwards from Castleton Way and falls away to the south east towards the Dove valley giving long distance viewing opportunities into the airfield site. Most of the land allocated for industrial development to the south of the planted tree belt around the compressor site is currently in agricultural use. Tall structures including the mast at the Gas Compressor Station, wind turbines and the Eye Chicken Litter Power Plant stack are visible on the skyline over intervening vegetation.

11.7.73 To the west of Eye Airfield between the A140 road and Great Eastern mainline railway highly sensitive visual receptors include residents at Duke's Bridge, Mellis, Mellis Green, Wortham and Gislingham, Open Access land, village greens and local PRoWs. Visual detractors within this area are the railway line and tower pylons carrying overhead transmission lines from Sizewell nuclear power station. Views of Eye Airfield across this predominantly flat landscape are restricted by abundant hedgerows/hedgerow trees leaving only the upper part of the wind turbines, and Chicken Litter Power Plant stack visible. There are open views from the A140 road between Castleton Way and Brome over extensive industrial development on the western side of Eye Airfield.

Trends for changes to the landscape baseline

11.7.74 The EADF sets out an aspirational plan for significant change that will arise near the proposed Project site from planned industrial development on the site of agricultural land within Eye Airfield, which is broadly centred on the main north-south runway. Likely future development includes wind turbines, IT centres, data centres, R&D, green products, high value engineering manufacture, insurance etc. with the more prestigious buildings located on the outer, more visible areas of the Airfield. New development would be set within extensive structure planting that would be designed for landscape integration, visual amenity, and to reinforce the historic runways. The Eye Airfield Development Framework also includes land allocated for new housing in areas adjoining existing modern residential development on the northern and western edges of Eye.

11.7.75 Within the wider landscape surrounding the site, trends are for larger agricultural buildings in open countryside that can conflict with the small scale field pattern of ancient enclosure. Hedgerow removal to facilitate agricultural intensification is likely to continue within areas used for arable crops.

11.7.76 The Core Strategy notes demand for business, space and housing is greatest in the vicinity of major roads, primarily the A14 and A140, and residential growth will be focussed in three towns, one of which is Eye. Away from the main transport corridors the landscape has a distinctive character with small, idyllic villages and attractive countryside, including the valleys of the River Waveney and River Dove, which each have their own unique characteristics and all are highly sensitivity to change.

11.8 Preliminary Assessment of Potential Impacts

POWER GENERATION PLANT

11.8.2 Indicative maximum dimensions of the SCGT plant structures are set out in Table 11.8 below.

Table 11.8 - Indicative Dimensions of Main Plant

Building	Number	Height (m)	Width (m)	Length (m)
Stacks	5	30	Diameter 10	n/a
GTG (plant housing dimensions)	5	20	20	35
Water tanks	2	10	Diameter 10	
Administration / workshop / control building	1	15	10	40
Gas receiving station	1	10	30	30
Switchyard	1	12.5	150	150

11.8.3 Security fencing 2.0 m high is required around the perimeter of the Power Generation Plant.

Sources of impact during construction

11.8.4 The construction and commissioning of the Power Generation Plant will last for approximately 24 months and will include all areas required for the permanent works as well as a temporary construction area adjoining the southern boundary of the Power Generation Plant. During this time, potential adverse temporary landscape and visual impacts will arise from the following activities:

- Site clearance, removal of vegetation and topsoil stripping from the Power Generation Plant site;
- Earthworks to construct platforms and excavate foundations;
- Construction of an internal road for access to the buildings and storage area;
- Movement of construction related traffic including delivery and removal of materials to and from site, off-site road traffic including workers travelling to and from the Power Generation Plant site;
- General construction activities including the movement of large scale construction equipment, i.e. tower cranes, smaller cranes, batching plants drilling rigs etc; site compounds and temporary buildings required for construction, parking on site, and materials stockpiles;
- Temporary hoardings and/or protective fencing and signage;
- Construction site lighting, in particular during the winter months;
- Construction of the SCGT and any other ancillary buildings; and

- Construction of the permanent perimeter security fence.

Sources of impact during operation

11.8.5 The following long term actions will contribute to the landscape and visual impact from the Power Generation Plant:

- The introduction of the SCGT plant and permanent structures associated with the gas and electricity grid connection on the Power Generation Plant site of former agricultural land. The final layout proposal will incorporate a degree of flexibility with respect to the actual sizing and siting of buildings / structures;
- The creation of new hard and soft landscape elements associated with the Power Generation Plant;
- Increased vegetation cover following tree and shrub mitigation planting subject to approval by MSDC;
- Perimeter security fencing along the boundary of the Power Generation Plant site;
- Operational traffic; and
- Increased lighting.

Sources of impact during decommissioning

11.8.6 Temporary landscape and visual impacts similar to those described for construction are likely to arise during decommissioning.

Preliminary assessment of impacts on landscape and landscape character

11.8.7 The introduction of the proposed structures, namely buildings and hard-surfaced areas associated with the Power Generation Plant, will add man-made elements to the landscape. Some would be of a significant scale, thereby establishing new landmark features and a point of reference in views from the wider area.

11.8.8 The direct effects in terms of landscape losses or change on the Power Generation Plant site are outlined as follows:

- Permanent displacement of an area of farmland over the extent of the proposed Power Generation Plant site; and
- Temporary displacement of an area of farmland south of the proposed Power Generation Plant for the construction works.

11.8.9 The Ancient Plateau Claylands landscape character area defined in the Suffolk Landscape Character assessment will be directly affected by

the Power Generation Plant. The landscape in the immediate vicinity of the Power Generation Plant site has been described in the baseline above. There are a number of existing industrial structures and facilities, the largest of these being the two wind turbines, National Grid Gas Compressor Station mast and Chicken Litter Power Plant stack, adjacent to the Power Generation Plant site. Woodland planting associated with the National Grid Gas Compressor Station and other existing structures will largely screen the Power Generation Plant from the north, north-east and north-west. From the further south, south-east and south-west the upper portions of the tallest elements of the Power Generation Plant are likely to be partly visible.

11.8.10 Some limited areas immediately to the south and south-east of the site boundary will be affected by visibility of the proposed Power Generation Plant. They include sections of public footpaths and residential development on the north western edge of Eye in particular.

11.8.11 The impact of the proposed Power Generation Plant on the adjacent local and national landscape character areas will be addressed in the final landscape and visual impact assessment produced as part of the final EIA.

11.8.12 Based on the information available the preliminary assessment considers the Power Generation Plant will form a visible and recognisable feature within an area of landscape that has the capacity to accommodate development of the nature proposed. Agricultural land will be lost permanently from the Power Generation Plant site and will be replaced by built elements and hard surfacing. The scale of the development would fit in with existing structures nearby. Localised effects arising from the Power Generation Plant would be of moderate significance and would reduce gradually as the perimeter landscape screen planting matures.

Preliminary assessment of impacts on visual amenity

11.8.13 The visual impact of the Power Generation Plant over the 15 km study area will be addressed in the final landscape and visual impact assessment produced as part of the final EIA. For the purposes of this report, visual impact has been considered on the basis of the preliminary site visit and covers part of the study area and some of the locations described below.

11.8.14 Photomontages of the Power Generation Plant from viewpoints VP3, VP11 and VP12 to the south east and south west of the site are shown at Figures 11.6 to 11.8. respectively They include wireframe and rendered images of the proposed structures. The ES will include a comprehensive range of photomontages from all viewpoints shown in

Table 1.7 and other locations in agreement with the relevant planning authorities.

11.8.15 The Power Generation Plant will be visible from the wider landscape to the south, south-east and south-west of the application site. In general, the upper portions of the stack(s) (up to 30 m high) will be visible . Smaller structures and buildings will be substantially screened by adjacent woodland and existing industrial buildings adjacent to the northern, eastern and part of the western boundaries of the Power Generation Plant site.

11.8.16 The stack(s) on the western side of the Power Generation Plant will be the main elements of the which will be visible from the south and west, and would cause a change to the skyline where they are visible over intervening woodland and industrial buildings. In this relatively flat landscape tall vertical elements such as the stack(s) may be visible over a long distance. The stack(s) would be seen in the context of other tall industrial structures within Eye Airfield.

11.8.17 Viewers located to the south of the Power Generation Plant site will be affected which will appear visually prominent on the site of land currently in agricultural use.

11.8.18 The main receptors with potential views of the proposed Power Generation Plant include:

- Residents at the edges of settlements located south, south-east and south-west of the application site such as at Eye, Yaxley, and the eastern edge of Mellis;
- Public footpath users between the application site and Castleton Way;
- Road users on the A140 road travelling in both directions;
- Road users and pedestrians using Castleton Way;
- Walkers using public footpaths contiguous with the airfield runways and the western and southern boundaries of the Power Generation Plant site (heritage site);
- Walkers along sections of the Mid Suffolk Footpath; and
- Recreational users at the viewing platform at Eye Castle (SAM).

11.8.19 Long term visual effects will change when future development is undertaken to the south of the Power Generation Plant site within Areas 10, 11 and 12 of the former Eye Airfield. Development in these locations would either screen or reduce the extent of views of the Power Generation Plant and associated infrastructure from locations to

the south. However, mitigation planting adjacent to the east – west runway within the application site is necessary to screen the Power Generation Plant and to emphasise the runway.

GAS CONNECTION

11.8.20 Two Gas Connection Options are under consideration for the Gas Connection varying between 0.1 km and 1.6 km in length depending on which option is developed. Connection to the National Transmission System would require the installation of a MOC facility of around 30 m x 30 m and a PTF of around 30 m x 23 m, which would be located within the Power Generation Plant site.

11.8.21 It should be noted that the plans in Section 4, Project and Site Description, show both route corridor options with large buffers or potential areas in which each route may be developed.

11.8.22 Where possible the pipeline would be constructed using 'trenchless' engineering techniques to avoid removing sections of hedgerows that cross its route. It would be buried to a depth of cover in accordance with industry standards, which is no less than 1.2 m in agricultural land. Technical advice would be sought from National Grid to establish planting restrictions near all above and below ground structures prior to developing the landscape strategy.

11.8.23 From National Grid's website it appears likely that hedge planting could be undertaken directly across the pipeline where visual screening is required and where it is necessary to gap up a field boundary hedge. National Grid requires planting in these locations is undertaken using shallow rooting species including hawthorn, blackthorn, elder, hazel and privet. Dense mass planting cannot be undertaken within 10 m of a pipeline, although individual specimens or a row of trees could be planted between 6 m and 10 m from it. Plant species should be selected from their list of suitable species.

GAS CONNECTION ROUTE CORRIDOR OPTION 1

11.8.24 Gas Connection Option 1 would be approximately 0.1km in length and would lie to the east of the Power Generation Plant and connect directly into the adjacent National Grid Compressor Station.

11.8.25 Construction of the underground pipeline would necessitate the removal of mature tree planting on the western and/or southern boundary of the National Grid Compressor Station. National Grid planting constraints would not allow the planting to be reinstated within 10 m on either side of the pipeline.

Construction

11.8.26 Potential adverse temporary landscape and visual impacts will arise from the following activities:

- Site clearance and removal of vegetation from the site of the Gas Connection Option 1 and part of the mature tree screen along the western and/or southern boundary of the National Grid Compressor Station;
- Earthworks to construct platforms and excavate foundations;
- Movement of construction related traffic including delivery and removal of materials to and from the construction site, off-site road traffic including workers travelling to and from the construction site;
- General construction activities including the movement of construction equipment, a site compound, temporary buildings, parking on site, materials stockpiles, protective fencing, and signage;
- Construction site lighting, in particular during the winter months.

Operation

11.8.27 The following long term actions will contribute to the landscape and visual impact from the proposed gas connection:

- Loss of mature trees in the immediate vicinity of the underground pipeline;
- Perimeter hedge or woodland planting to screen the compound; and
- New access road and operational traffic.

Decommissioning

11.8.28 Temporary landscape and visual impacts similar to those described for construction are likely to arise during decommissioning.

Preliminary assessment of impacts on landscape and landscape character

11.8.29 The introduction of the proposed industrial structures, security fencing and hard surfacing will add man-made elements to a landscape where similar structures already exist. The structures will be visible over a wide area to the south of the Gas Connection Option 1 area until the intervening area at the former Eye Airfield is developed, which will screen views from PRoWs and settlements at Eye.

11.8.30 The direct effects in terms of landscape losses or change on the Gas Connection Option 1 area are as follows:

- Permanent displacement of a small area of farmland for the access road;
- Temporary displacement of an area of farmland south of the proposed Project for the construction works; and
- Permanent loss of tree cover within the National Grid Compressor Station.

11.8.31 The Gas Connection Option 1 area lies adjacent to the A – Agricultural landscape character area in the EADF which is described in the baseline study, and has high sensitivity to change. Landscape character in the immediate vicinity of the Gas Connection Option 1 area will be altered by the introduction of industrial development. However, the proposed gas connection would be sited adjacent to similar structures within the Project and National Grid Compressor Station. Mitigation screen planting will be undertaken along the perimeter of the site, subject to National Grid constraints.

11.8.32 The impact of the proposed gas connection on the adjacent local and national landscape character areas will be addressed in the final landscape and visual impact assessment produced as part of the final ES. However, based on a preliminary assessment it is considered that the impacts identified above arising as a result of Gas Connection Option 1, will have a [slight to moderate significance depending on the extent of screen planting removed from the southern boundary of the National Grid Compressor Station. This preliminary assessment is based on PPL's current understanding of the landscape impacts, which may change following further assessment work (albeit it is not considered that any change in assessment conclusion will be significant).

Preliminary assessment of impacts on visual amenity

11.8.33 The visual impact of the gas connection compound will be addressed in the landscape and visual impact assessment produced for the ES. The extent of visibility of the proposal will be assessed through site work undertaken during the winter months when screening from existing hedgerows/woodland is least effective. For the purposes of this report, visual impact has been considered on the basis of the preliminary site visit from the locations described below.

11.8.34 The proposed gas connection compound will be visible from the wider landscape to the south. Mitigation planting would screen views of ground level structures and activities.

11.8.35 The main receptors with potential views of the Gas Connection Option 1 include:

- Residents at the edges of settlements located south and south-west of the application site at Eye and Langton Grove;
- People using the network of PRoWs between Eye and Castleton Way;
- Road users and pedestrians using Castleton Way; and
- Walkers using public footpaths contiguous with the airfield runways and the western and southern boundaries of the application site (heritage site).

11.8.36 Based on a preliminary assessment it is considered that the impacts identified above arising as a result of Gas Connection Option 1, will have a [slight significance providing there is minimal loss of screen planting along the southern boundary of the National Grid Compressor Station. This preliminary assessment is based on PPL's current understanding of the visual impacts, which may change following further assessment work albeit it is not considered that any change in assessment conclusion will be significant).

GAS CONNECTION ROUTE CORRIDOR OPTION 2

11.8.37 Gas Connection Option 2 would be approximately 1.5km in length and would be sited within agricultural land. The MOC or Above Ground Installation would be sited close to Castleton Way.

Construction

11.8.38 Construction impacts would be similar to those described for Gas Connection option 1 above with the addition of the MOC facility and perimeter security fence.

Operation

11.8.39 Operational impacts would be similar to those described for Gas Connection option 1 above with the addition of the permanent MOC industrial structures enclosed by security fencing 2m high.

Decommissioning

11.8.40 Decommissioning impacts would be similar to those described for Gas Connection option 1 above.

Preliminary assessment of impacts on landscape and landscape character

11.8.41 The introduction of the proposed industrial structures, security fencing and hard surfacing will add man-made elements to an area of rural landscape. Although the gas connection would be seen in the context of similar structures within the airfield they would be sited at a distance of >0.6km within agricultural land where they would appear incongruous until future development is undertaken in adjacent areas at former Eye Airfield.

11.8.42 The direct effects in terms of landscape losses or change to the Gas Connection Option 2 area are as follows:

- Permanent displacement of a small area of farmland for the MOC and access road;
- Temporary displacement of an area of farmland for the construction works; and
- Mitigation tree and shrub screen planting surrounding the MOC.

11.8.43 The Gas Connection Option 2 area lies within the F – Rural lane landscape character area in the EADF, and has high sensitivity to change. Landscape character in the immediate vicinity of the site will be changed by the introduction of the gas connection and other planned industrial development. Mitigation screen planting will be undertaken along the perimeter of the subject to National Grid constraints.

11.8.44 The impact of the proposed gas connection on the adjacent local and national landscape character areas will be addressed in the final landscape and visual impact assessment produced as part of the final EIA. However, based on a preliminary assessment it is considered that the impacts identified above arising as a result of Gas Connection Option 2, will have a slight significance]. This preliminary assessment is based on PPL's current understanding of the landscape impacts, which may change following further assessment work (albeit it is not considered that any change in assessment conclusion will be significant).

Preliminary assessment of impacts on visual amenity

11.8.45 The visual impact of the gas connection compound will be similar to Gas Connection option 1, and site survey will verify the extent of potential visibility.

11.8.46 The proposed gas connection compound will be visible from the wider landscape to the south. Mitigation planting will screen views of the lower level structures and ground level activities.

11.8.47 The main receptors with potential views of the Gas Connection Option 2 are.

- People using the network of public footpaths between Eye Airfield and Castleton Way;
- Road users and pedestrians using Castleton Way; and
- Walkers using public footpaths contiguous with the airfield runways and the western and southern boundaries of the Project site (heritage site).

11.8.48 Based on a preliminary assessment it is considered that the impacts identified above arising as a result of Gas Connection Option 2, will have a slight significance]. This preliminary assessment is based on PPL's current understanding of the visual impacts, which may change following further assessment work (albeit it is not considered that any change in assessment conclusion will be significant).

ELECTRICAL CONNECTION COMPOUND AND CONNECTION

11.8.49 The assessment considers two options for the location of the Electrical Connection and Electrical Connection Compound to the west of the Power Generation Plant site adjacent to the existing 400 kV transmission system. In order to avoid adverse visual impact the cables would be buried underground. The Electrical Connection Compound would be sited close to the existing overhead transmission line due west of the Power Generation Plant and A140.

11.8.50 The Electrical Connection Compound and surrounding mitigation planting will be designed to fit in with the rectangular field pattern. Existing hedgerows will form the boundaries to the compound on one or two sides to assimilate it into the landscape. Mitigation screen planting will contain the same species of trees and shrubs as hedgerows nearby and include a high proportion of hedgerow trees. Tree and shrub planting will be constrained near the underground cable.

ELECTRICAL CONNECTION COMPOUND AND CONNECTION OPTION 1

11.8.51 Electrical Connection Compound and Electrical Connection Option 1 is located within agricultural land to the south of The Leys and north of Mellis Road. It would be sited within arable land characterised by small to medium scale rectangular fields enclosed by tall hedges. The route

would be designed to avoid loss of hedgerows and disruption to agriculture.

Construction

11.8.52 Potential adverse temporary landscape and visual impacts will arise from the following activities:

- Site clearance and removal of vegetation from the Electrical Connection Compound and Electrical Connection Option 1 area;
- Topsoil and subsoil stripping from agricultural land and temporary stockpiles;
- Earthworks to construct platforms and excavate foundations;
- Construction of an internal road for access to the electrical connection compound;
- Movement of construction related traffic including delivery and removal of materials to and from the Electrical Connection Compound and Electrical Connection Option 1, off-site road traffic including workers travelling to and from Electrical Connection Compound and Electrical Connection Option 1;
- General construction activities including the movement of construction equipment, a site compound, temporary buildings, parking, materials stockpiles, protective fencing, and signage;
- Construction site lighting, in particular during the winter months; and
- Construction of the electrical connection structures and perimeter security fence.

Sources of impact during operation

11.8.53 The following long term actions will contribute to the landscape and visual impact from the Electrical Connection Compound and Electrical Connection Option 1:

- The introduction of permanent industrial structures up to 12 m high enclosed by security fencing 2m high set within rural landscape;
- Loss of agricultural land;
- Perimeter hedge or woodland planting to screen the compound; and
- New access road and operational traffic.

Sources of impact during decommissioning

11.8.54 Temporary landscape and visual impacts similar to those described for construction are likely to arise during decommissioning.

Preliminary assessment of impacts on landscape and landscape character

11.8.55 The introduction of the proposed industrial structures, security fencing and hard surfacing will add incongruous man-made elements to the landscape. The structures would be of a significant scale and would be visible over a wide area, particularly during the winter months following leaf fall.

11.8.56 The direct effects in terms of landscape losses or change on the site are as follows:

- Permanent displacement of an area of farmland covering the full extent of the electrical connection compound and access road;
- Temporary displacement of a wide (~30m) area of farmland along the length of the electrical connection for the construction works;
- Permanent displacement of a narrow (~10m) area of farmland along the length of the electrical connection for the operational access; and
- Removal of hedgerows to accommodate the construction trench and subsequent reinstatement planting.

11.8.57 The Electrical Connection Compound and Electrical Connection Option 1 site lies within the Ancient Plateau Claylands landscape character area which is described in the baseline study. Landscape character in the immediate vicinity of the Electrical Connection Compound and Electrical Connection Option 1 will be directly affected by the introduction of industrial development. However, the proposed Electrical Connection Compound would be sited adjacent to the existing high voltage overhead transmission line that runs roughly parallel with the A140.

11.8.58 The impact of the proposed electrical connection on the adjacent local and national landscape character areas will be addressed in the final landscape and visual impact assessment produced as part of the final EIA. However, based on a preliminary assessment it is considered that the impacts identified above arising as a result of Electrical Connection Compound and Electrical Connection Option 1, will have a slight significance over a localised area This preliminary assessment is based on PPL's current understanding of the landscape impacts, which may

change following further assessment work (albeit it is not considered that any change in assessment conclusion will be significant).

Preliminary assessment of impacts on visual amenity

11.8.59 The visual impact of the Electrical Connection Compound Option 1 will be addressed in the landscape and visual impact assessment produced for the ES. The extent of visibility of the proposal will be assessed through site work undertaken during the winter months when screening from existing hedgerows is least effective. For the purposes of this report, visual impact has been considered on the basis of the preliminary site visit from the locations described below.

11.8.60 The proposed Electrical Connection Compound Option 1 will be visible from the wider landscape in all directions. Views will be limited to the upper part of the structures above and through intervening hedgerows. The dense network of tall hedgerows with trees near the compound will screen or filter views of the lower structures and security fencing.

11.8.61 The main receptors with potential views of the Electrical Connection Compound Option 1 include:

- Residents at the edges of settlements located to the south, west and north at Yaxley, Mellis, Thrandeston and Goswold Hall respectively;
- Public footpath users in the vicinity of Goswold Hall, including the bridleway along Love Lane to the east, and the bridleway along Green Lane to the west; and
- Road users on the A140 road travelling in both directions.

11.8.62 Based on a preliminary assessment it is considered that the impacts identified above arising as a result of the Electrical Connection Option 1 and Electrical Connection Compound Option 1, will have a moderate significance over a localised area. This preliminary assessment is based on PPL's current understanding of the visual impacts, which may change following further assessment work (albeit it is not considered that any change in assessment conclusion will be significant).

ELECTRICAL CONNECTION COMPOUND AND ELECTRICAL CONNECTION OPTION 2

11.8.63 The Electrical Connection Compound and Electrical Connection Option 2 site is located within agricultural land to the north east of The Leys and west of Love Lane. It would be sited within arable land characterised by medium scale fields where hedges have been removed to facilitate arable farming. The route would be designed to avoid loss of natural features, hedgerows and disruption to agriculture.

Construction

11.8.64 Construction impacts would be similar to those described for Electrical Connection Option 1 and Electrical Connection Compound Option 1 above.

Operation

11.8.65 Operational impacts would be similar to those described for Electrical Connection Option 1 and Electrical Connection Compound Option 1 above.

Decommissioning

11.8.66 Decommissioning impacts would be similar to those described for Electrical Connection Option 1 and Electrical Connection Compound Option 1 above.

Preliminary assessment of impacts on landscape and landscape character

11.8.67 The Electrical Connection Option 2 and Electrical Connection Compound Option 2 area also lies within the Ancient Plateau Claylands landscape character area. Impacts on landscape and landscape character would be similar to Electrical Connection Option 1 and Electrical Connection Compound Option 1 and the proposed industrial structures, security fencing and hard surfacing would be incongruous within the wider landscape. However, they would relate logically to the existing overhead transmission line. The structures would be of a significant scale and would be visible over a wide area, particularly during the winter months following leaf fall.

11.8.68 The impact of the proposed electrical connection on the adjacent local and national landscape character areas will be addressed in the final landscape and visual impact assessment produced as part of the final EIA. However, based on a preliminary assessment it is considered that the impacts identified above arising as a result of Electrical Connection Option 2 and Electrical Connection Compound Option 2, will have a slight significance. This preliminary assessment is based on PPL's current understanding of the landscape impacts, which may change following further assessment work (albeit it is not considered that any change in assessment conclusion will be significant).

Preliminary assessment of impacts on visual amenity

11.8.69 The visual impact of the Electrical Connection Compound Option 2 will be similar to Option 1 . The structures will be visible from the wider

landscape above and through intervening hedgerows. However, the small-scale field pattern enclosed by tall hedgerows with trees in this location may provide more screening than the vegetation surrounding Electrical Connection Compound Option 1.

11.8.70 The main receptors with potential views of the Electrical Connection Compound Option 2 include:

- Residents at the edges of settlements located to the south and west at Yaxley and Mellis respectively;
- People using PRoWs including the bridleway along Love Lane to the east, and the bridleway along Green Lane to the west; and
- Road users on the A140 road travelling in both directions.

11.8.71 Based on a preliminary assessment it is considered that the impacts identified above arising as a result of the Electrical Connection Option 2 and Electrical Connection Compound Option 2, will have a moderate significance over a localised area. This preliminary assessment is based on PPL's current understanding of the visual impacts, which may change following further assessment work (albeit it is not considered that any change in assessment conclusion will be significant).

11.9 Potential Mitigation / Management Techniques

11.9.1 Mitigation of adverse environmental impacts can be achieved by avoidance, reduction, remedying of, or compensation. Primary mitigation measures form an intrinsic part of the proposed Project design through an iterative process. Secondary mitigation measures are those that are designed to address specifically the remaining (residual) adverse effects of the final development proposals.

11.9.2 Mitigation will be developed in the ES to provide a landscape strategy for the development that will fulfil relevant objectives illustrated in the Eye Airfield landscape Strategy (Dwg. No. 2162/D10) and the Development Brief. Section 2.7 of the Eye Airfield Development Brief, Views and visual sensitivities, provides the following guidance for mitigation that will be developed in the landscape strategy for the proposed development:

- “Care should be taken in the design of any future development proposal that might impact on the viewpoints of greatest sensitivity and amenity. This will include resisting development in areas of highest sensitivity, and guiding development to areas of lower sensitivity;

- Where development takes place, careful consideration should be given to siting, scale, colour and massing of development and how its impacts might be mitigated;
- There are opportunities to enhance views by introducing shelterbelts and reinforcing hedgerows and tree belts, strengthening important wooded ridgeline characteristics. The general area of the site that contributes most to visual amenity, and from where views of highest sensitivity are located is the southern part of the site (character area A);
- The rural lane corridor along Castleton Way is considered particularly sensitive, due to the proximity of public footpaths and footpaths that link to it, and its topography of slopes falling to the south. Viewed from the south, character area A slopes up to a horizon occupied by the existing industrial estates and the planted tree belt south of the compressor site; and
- A consistent approach is required for strategic landscape planting across the site that could be reasonably expected to mitigate and minimise the landscape and visual impact of the development."

11.9.3 Under 'Landscape Design Code' the Development Brief provides the following specific design guidance:

- "The landscape structure of the airfield site is to be reinforced and extended with an objective to connect with landscape features beyond the site boundary;
- The historical features of the site of significance are to be retained and incorporated into the strategic layout of the site;
- Any new development incorporating chimneys, flues, masts or other vertical structures and tall industrial buildings should be sensitively planned, sited and designed, and carefully considered in relation to sensitive local views;
- Proposals for landscape mitigation should be commensurate with the landscape and visual impacts of development proposals;
- Lighting, particularly exterior lighting, should be designed and installed so it minimises detrimental landscape and visual impacts;
- A range of appropriate tree and shrub species should be used, having due regard for the requirements of the National Grid guidance where planting is near to pipelines."

11.9.4 Recommendations for landscape mitigation within the vicinity of the Project Site contained in the Eye Airfield Landscape Strategy relate to the provision of structure planting adjacent to the airfield runways.

Planting should typically be native species hedgerows comprising predominantly hawthorn with oak and field maple standards.

11.9.5 Mitigation planting along the western and southern boundaries of the Project Site adjacent to the airfield runways would be a key landscape feature of the proposed Project and the wider airfield. Planting along the western boundary of the application site would be part of a greater length of structure planting adjacent to the main north – south runway where the main objective is to emphasise the historic runway. Therefore, it is essential that all planting is similar in form, species composition and management to provide a uniform appearance. The structure planting could be either a woodland belt or a hedgerow with hedgerow trees.

11.9.6 Similarly, the same planting theme should continue along the southern boundary adjacent to the east – west runway. Planting in both locations should be sited outside the proposed Project site perimeter security fence to screen the industrial fence and provide a 'green' edge adjacent to the runways. Further consultation will be undertaken with MSDC prior to developing structure planting proposals in areas of the site adjacent to the runways.

11.9.7 Planting constraints are likely to exist in the vicinity of the Project Site. They may include buried archaeology, ecological habitats, and underground or overhead services. All restrictions will be identified prior to developing the site landscape strategy. Mitigation planting will be developed to fulfil ecological objectives and enhance biodiversity where possible. The landscape strategy will comprise proposals for planting and its subsequent management for a minimum period of 5 years to ensure the landscape objectives are achieved successfully.

11.9.8 As part of the iterative design process for the development, primary mitigation relating to the design, layout, selection of materials and colours for the proposed Project structures and associated infrastructure will be reviewed following this preliminary assessment. Planting to screen views from highly sensitive receptors will be incorporated into the site landscape strategy where practical.

Construction

11.9.9 During construction, the following measures would be included in the Construction Environmental Management Plan (CEMP):

- Limiting land clearance and occupation to the minimum necessary for the works;

- Temporary protection of vegetation and other vulnerable features to be retained in accordance with current industry standards and recognised best practice;
- Temporary storage of topsoil and any other material considered of value for retention. Where practical stores would be sited to screen the construction works from highly sensitive receptors;
- Design and layout of site construction areas to reduce adverse impacts arising from the temporary security fencing and lighting;
- Agreed site access routes;
- Restricting construction site lighting outside normal working hours to the minimum required for workforce and public safety and security. Directional luminaries to be used to limit unwanted light spill;
- Maintenance of tidy and contained site compound;
- Temporal measures including the removal of all temporary structures and stockpiles when no longer required, and prompt reinstatement of temporary construction areas;
- Spreading of topsoil, reseeding and planting within the application site and adjoining areas of agricultural land that are to be reinstated as soon as possible after sections of work are complete; and
- Management of all reinstated area in accordance with a 5 year aftercare plan to ensure full and successful establishment of the planting and agricultural areas to the approval of the planning authority.

Operation

11.9.10 To summarise, during operation mitigation would include:

- The high quality design of the proposed buildings, structures and perimeter security fencing;
- Neutral colours with a matt finish to reduce the visual impact of new structures. Colours will be selected to blend with existing buildings within Eye Airfield. They will be agreed with MSDC / SCC and discussed in more detail in the ES and the Design and Access Statement
- Structure / hedgerow planting on the perimeter of the site to reduce views of ground level operational activities, and to emphasise the airfield runway corridors (historic features);
- Planting with native species of trees and shrubs similar to those present nearby, using local provenance stock wherever possible, in

order to enhance biodiversity and connect habitats to form an ecological network;

- Amenity planting at the site entrance using a proportion of large size trees for immediate effect; and
- The design of external lighting to reduce trespass, glare and spillage and by restricting usage to the minimum periods required.

Decommissioning

11.9.11 Similar mitigation measures to those described above for construction would be implemented during decommissioning.

11.10 Preliminary Assessment of Residual Effects

11.10.1 The preliminary assessment described above has concluded that direct effects on the landscape fabric, character and views will arise during construction and operation of the proposed Project. Further detailed assessment will be undertaken to establish the significance of the landscape and visual effects, and will be presented in the ES.

11.10.2 This preliminary assessment will inform the development of the design of the proposed Project to ensure embedded and secondary mitigation measures are incorporated to avoid or reduce adverse residual landscape and visual effects wherever possible. Landscape mitigation described above will be developed following guidance set out in the EADF and Landscape Strategy.

11.10.3 No overall significant effects are likely to arise on designated Village Greens, Common Land or Open Access Land, or on locally designated Special Landscape Areas within the study area.

11.10.4 The potential for visual effects on settlement within the study area would be restricted to the outer edges of settlements nearest to the proposed Project at Eye, Yaxley, Mellis Green, Palgrave, Thornham Parva, Thrandeston, Stuston and Brome. Winter site survey will be undertaken to establish the extent of change in the composition of existing views. From the preliminary assessment no significant visual effects are predicted to arise.

11.10.5 Potential visual effects will arise to PRoWs within the southern part of Eye Airfield extending to Castleton Way including the airfield runways (heritage site), and to bridleways at Love Lane and Green Lane to the west of the A140. Significant effects of short term duration are predicted during construction and would be mitigated by screen planting during operation.

11.10.6 The Power Generation Plant would be sited within an area of the former Eye Airfield where it would be seen in the context of similar industrial buildings, wind turbines and mature woodland belts/hedgerows. It would be sited near the National Grid Transmission Station and the chicken litter biomass power station, which comprise industrial building and stacks similar in scale to those proposed. The height of the Power Generation Plant stacks would be no more than 30m high, significantly lower than the 40m high stack within the biomass power station. The scale of the stacks and taller structures would be modified by existing and proposed wind turbines >100 m high to the north and west of the Power Generation Plant. Potentially significant landscape and visual effects would be localised and would reduce as screen planting matures and adjacent open land to the south is developed by others. It will be designed to meet relevant landscape and visual objectives set out in the EADF, and will be sited within an area of Eye Airfield that has the capacity to accommodate development of the nature and scale proposed.

11.10.7 Landscape and visual impacts from the proposed Electrical Connection will be substantially mitigated by burying the cables underground. Options 1 and 2 for the Electrical Connection Compound will result in the introduction of incongruous industrial structures in the surrounding rural landscape, and loss of agricultural land. Effects would be reduced by micrositing the Electrical Connection Compound within the existing field pattern and by screen planting using native species. A similar approach will be taken for the gas connection above ground installation.

11.10.8 It is considered that potential landscape and visual effects would be localised due to the industrial character of the area surrounding the proposed Project, and by the extensive network of hedgerows and woodland within the vicinity of the Project Site.

11.11 Next Steps

11.11.1 A full LVIA will be undertaken in accordance with the assessment methodology and significance criteria, to dete*rmine potential* significant landscape and visual impacts and to develop appropriate mitigation. It has not been possible to carry out the full assessment at this stage due to foliage that provides screening. This foliage prevents a worst-case assessment from being carried out and thus a full assessment will be carried out later in 2013 when the screening effects from plants are at their lowest.

11.11.2 Further consultation will be undertaken with MSDC, BDC, SNC to and SCC select viewpoints to be assessed in the LVIA. Photomontages (including night time views) and wireframes of the proposed Project will

be produced from selected viewpoints in consultation with the local planning authorities.

11.11.3 Consultation will be undertaken with MSDC and SCC with respect to the landscape strategy for the Project site in areas adjoining the historic airfield runways.

11.11.4 The information presented in this section will be supplemented in the ES.

SECTION 12

WASTE MANAGEMENT AND HEALTH

12 WASTE MANAGEMENT AND HEALTH

12.1 Introduction

12.1.1 This Section of the PEIR addresses the waste management strategy and potential public health impacts of the proposed Project.

12.1.2 At present, it is anticipated that the main potential impacts to human health arising from the proposed Project will result from changes to local air quality during the construction, operation and demolition stages. However, as with any project of this magnitude, there are also potential impacts arising from pollution incidents, site run-off and noise impacts.

12.1.3 The biggest potential impacts regarding waste management will be from site preparation during construction.

12.1.4 The results of preliminary technical assessments relating to specific environmental impacts are presented in Sections 6 to 11 and 13-14 of this PEIR. The aims of this section therefore are to:

- Identify impacts arising from the generation of waste during the construction, operational and decommissioning stages of the Project and assess the significance of these impacts and how they can be mitigated.
- Describe other potential impacts arising from the Project that may be detrimental to human health and how these impacts can be mitigated.

12.2 Legislative and Policy Context

National Policy Statements

12.2.2 Overarching National Policy Statement for Energy (NPS EN-1) sets out assessment principles that are particularly likely to be relevant to energy NSIPs. In relation to waste and health related impacts it states:

- Safety (paragraph 4.11) and Hazardous Substances (4.12): describes the relationship with other regimes and the general requirement that the decision maker will need to be satisfied that they are complied with.
- Health (4.13): requires that an assessment of potential health impacts is made in relation to each element of the proposed Project, such as in relation to air quality, waste or noise and describing the relationship with other regimes, stating at 4.13.5 that where separate air quality regulations are (or will be) satisfied then

the decision maker is likely to consider these effective mitigation, whereas for noise or other aspects it will take account of health concerns when setting requirements.

- Waste Management (5.14): requires that waste is managed through the 'waste hierarchy', explains the relationship with the environmental permitting (EP) regime, and sets assessment principles to be used by the Secretary of State in determining an application for a DCO for an energy NSIP. These include the suggestion of a site waste management plan within the application, demonstrating that waste volumes are minimised, the impacts of at least the first five years of operation are assessed, and that waste is properly managed.

Other National and Local Policy

12.2.3 Whilst the PA 2008 is clear as to the primacy of the relevant NPS, other national and local planning policy can be considered important and relevant by the Secretary of State in the determination of an energy NSIP.

12.2.4 The National Planning Policy Framework (2012) sets out the Government's view of the principles of sustainable development along with guidance for local authority development planning and decisions on applications for planning permission. It seeks at paragraph 120 that planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account.

12.2.5 Policy CS4 of the Mid Suffolk Core Strategy 2008 seeks to protect people and the environment from unsafe or unhealthy pollutants, by avoiding development that harms the quality of soil or air and/or causes noise, dust, odour or light pollution wherever possible.

12.2.6 The Suffolk County Council Minerals and Waste Development Framework Provides the policy framework for determining minerals and waste planning applications. The Waste Core Strategy DPD (adopted 2011) covers the period to 2026 and establishes the overarching principles and policy direction for determining waste planning applications within Suffolk during this period. It also identifies strategic waste management sites across the County.

12.3 Project Scenario for Assessment

12.3.1 In respect of waste management and health, the realistic worst case scenario from within the proposed project parameters (which are described in Section 4 of the PEIR) are set out in Table 12.1 below.

12.3.2 The reason that the parameters identified in Table 12.1 represent the realistic worst case in relation to waste management and health impacts are that a greater number of GTG units will give rise to more waste during operation (e.g. more filters, more waste water from blade washing) and, as described in Sections 6 and 7 of this PEIR, give the largest potential in terms of air quality and noise, which, in turn has the potential for more detrimental impacts on human health.

12.3.3 A preliminary assessment of both options for the Gas Connection and the Electrical Connections is presented in this section. A decision on the preferred option for each will be taken following consultation. An assessment of the Electrical Connection Compound siting options will be provided in the full ES.

Table 12.1- Worst case parameters for the proposed Project considered within this assessment

Parameters	Details
Power Generation Plant	
Number of gas turbine units	5 (~ 59 MW)
Number of stacks	5
Unit type	Aero derivative

12.4 Assessment Methodology and Significance Criteria

12.4.1 The assessment methodology and significance criteria used in this section differ for each of the potential impacts considered. They are set out in detail in Sections 6-11 and 13-14 of this PEIR. Where the methodology differs for determining impacts specific to human health, these have been stated.

12.5 Baseline Conditions and Receptors

12.5.1 The study area and specific receptors for each area of impact considered within this PEIR (Sections 6 to 14) are discussed in those sections.

12.5.2 In general, for public health impacts to be realised, the following must exist:

- A source of (e.g.) contamination, dust or nuisance noise;
- A pathway; and
- A human receptor.

12.5.3 Given the nature of the proposed Project, there are potential sources of contamination (e.g. stack emissions may result in a change in air quality). Therefore, to minimise public health impacts, the sources must be controlled and / or pathways to receptors must be blocked.

12.5.4 Receptors can become exposed to contamination via dermal contact, oral contact or inhalation of a contaminated medium. Receptor sensitivity varies in relation to health, age and duration of exposure.

12.5.5 In this Section, potential receptor groups refer only to human receptors that could potentially come into contact with contaminants resulting from the Project: These receptors include:

- Residents of surrounding towns / villages;
- Adjacent commercial users;
- Recipients of agricultural produce;
- Recreational users (e.g. users of public rights of way); and
- Users of transport infrastructure.

12.5.6 Surrounding towns and villages include:

- Eye (1.7 km south east of the Power Generation Plant);
- Langton Green (1.3 km east of the Power Generation Plant);
- Yaxley (1.5 km South West of the Power Generation Plant); and
- Diss (4.75 km north of the Power Generation Plant).

12.5.7 Adjacent commercial users include other businesses within the Eye Airfield Industrial Estate.

12.5.8 Section 3 of this PEIR provides further details of the proposed Project redline boundary and its surroundings.

12.6 Air Quality

12.6.1 Section 5 of this PEIR provides a description of the preliminary assessment of the air quality impacts of the proposed Project undertaken as part of the EIA process.

12.6.2 The identified primary pollutants of concern from an air quality perspective are:

- Dust (PM_{10} and $PM_{2.5}$) during construction activities; and
- Oxides of nitrogen (NO_x) during operation.

12.6.3 Elevated levels of these pollutants could cause negative health impacts to human receptors, including both cardiovascular and respiratory problems[9]. Children are particularly susceptible with regards to elevated NOx concentrations, and epidemiological studies have revealed the prolonged exposure to elevated NOx concentrations reduces lung function in children.

12.6.4 DEFRA provides health banding for concentrations of air pollutants likely to induce public health impacts in susceptible individuals[10]. These can be used as guidelines against which the human health impact of emissions to air can be assessed. For PM_{10} and NO_x, details are provided in Table 12.2.

Table 12.2 - DEFRA Air Quality Health Bandings

Banding	**Health Descriptor**	**PM_{10} Concentration ($\mu g/m^3$) (Hourly Mean)**	**NO_x Concentration ($\mu g/m^3$) (Hourly Mean)**
Low	Effects unlikely to be noticed, even by sensitive individuals	0 – 64	0 – 286
Moderate	Mild effects may be noticed by sensitive individuals	64 – 96	287 – 572
High	Significant effects noticed by sensitive individuals	97 – 129	573 – 700
Very High	Effects on sensitive individuals may	130 +	764 +

[9] *World Health Organisation (WHO) Guidelines: Available at http://whqlibdoc.who.int/hq/2006/WHO_SDE_PHE_OEH_06.02_eng.pdf (Accessed 06/09/2011).*

[10] *DEFRA Air Pollution Bandings: Available at http://uk-air.defra.gov.uk/air-pollution/bandings?view=no2#pollutant (Accessed 06/09/2011).*

	worsen		

12.6.5 Additionally, the AQS Regulations specify a series of standards and objectives for air quality in the UK. The objectives are summarised in Section 6 of this PEIR.

Construction - whole Project

12.6.6 During construction, dust emissions from the proposed Project will not be more significant than those normally encountered on construction sites. The dust particles that may be emitted during construction would be of large diameter and would therefore tend to resettle on the ground within 100 m to 500 m of the source; approximately 70 per cent of the dust would generally settle out of the atmosphere within 200 m, and less than 10 per cent could be expected to remain at a distance of 400 m. This is reflected in the distance-related significance criteria presented in Section 5 of this PEIR.

12.6.7 The nearest housing is approximately 600m east of the Power Generation Plant boundary and approximately 200m from the Gas and Electrical Connections. . Therefore there is little potential that these properties could be impacted by dust from construction activities.

12.6.8 In order to limit any impacts, a CEMP will be prepared prior to construction, which will be prepared in accordance with the outline CEMP to be produced as an Appendix to the final EIA. This will require PPL and its contractors to implement a comprehensive dust suppression / mitigation and monitoring programme, based on '*The control of dust and emissions from construction and demolition – Best Practice Guidance*' (Greater London Authority, 2006). The implementation of these mitigation measures, as appropriate to the level of risk for each area / activity within the construction site (and the access roads to the site) will ensure that the impact of dust emissions from the construction site will not be significant. This will prevent construction work generating levels of atmospheric dust and emissions which would constitute a health hazard or nuisance to local people or industry.

Operation – Power Generation Plant

12.6.9 To accommodate all operating scenarios for the Power Generation Plant, a stack height of at least 20 m would be required in order to ensure adequate dispersion of the principal emissions. This minimum height would be secured by provisions in the draft DCO submitted as part of the application for a DCO for the proposed Project.

12.6.10 The preliminary results of the air dispersion modelling studies are presented in Section 5.5 of this PEIR which presents the anticipated maximum process contribution to ground level concentrations of the identified pollutants as a result of operation of the Power Generation Plant, together with an assessment of the significance of the resulting total predicted environmental concentration.

12.6.11 Based on the bandings shown in Table 12. and the anticipated air quality impacts (including the maximum predicted environmental concentration) of the Power Generation Plant detailed in Section 6.5 it is extremely unlikely that the Power Generation Plant will have any adverse public health impacts with respect to air quality.

12.6.12 Furthermore, in order that the Power Generation Plant operates in accordance with the appropriate legislation and guidance, and to avoid air quality reaching prolonged unsafe levels, the Power Generation Plant will be designed in accordance with BAT as outlined in the 'Reference Document on Best Available Techniques for Large Combustion Plant' (EU IPPC Bureau, 2006) and the Environment Agency (EA) Sector Guidance Note 'How to comply with your environmental permit: Combustion Activities (EPR 1.01)' (2009). This will be addressed through the Environmental Permit for the proposed Project.

12.6.13 The air quality assessment will also addresses the potential for impacts arising from increased vehicle movements as a result construction of the Project.

Operation – Gas and Electrical Connection route corridor options and Electrical Substation options

12.6.14 During operation, it is not anticipated that there will be any impacts on air quality from the gas and electrical connections. They will not emit any pollutants and will require only very occasional maintenance which would generate an insignificant number of vehicle movements.

Decommissioning - whole project

12.6.15 Works to decommission the Power Generation Plant, Electrical Connection Compound and Gas and Electrical Connection will be similar to those for construction. Therefore, the assessment undertaken for the construction phase is capable of acting as a proxy in each case for the demolition and decommissioning of the proposed Project. The air quality assessment has adopted this approach. Therefore, the air quality impacts from decommissioning on public health will be similar to those for construction. A demolition and restoration plan, which will mitigate any effects on public health from the decommissioning of the

proposed Project will be submitted to and agreed with MSDC / Environment Agency as a condition attached to the DCO.

Conclusion

12.6.16 Based on the results of the above assessments, it can be concluded that the proposed Project will result in no likely significant effects on public health with respect to air quality.

12.7 Noise and Vibration

12.7.1 Section 7 provides details of the preliminary noise and vibration impact assessment undertaken for the development of the proposed Project.

12.7.2 The existing baseline conditions at noise sensitive receptors in the vicinity of the proposed Power Generation Plant site have been established by way of an attended noise survey as outlined in Section 10.4 – Baseline Conditions and Receptors.

12.7.3 In order to determine the study area for the noise impact assessment, MSDC and the EA were consulted in order to agree a baseline noise survey methodology for the EIA for the Project. These discussions identified the nearest residential properties that could potentially be affected by noise generated during construction, operation and decommissioning of the Project, and considered to be noise sensitive receptors (NSR).

12.7.4 The Power Generation Plant site comprises land on the Eye Airfield industrial estate. The surrounding area is mainly open agricultural land with scattered residential dwellings. The small town of Eye is at a distance of approximately 1.3 km to the south east of the Power Generation Plant site, and the village of Yaxley at a distance of 800 m to the south west. The baseline noise climate in the area is largely dominated by road traffic during the daytime. During the night time when road traffic levels reduce a continuous low level noise is audible from the existing Eye Chicken Litter Power Plant.

12.7.5 The proximity of other noise-sensitive locations has also been considered as part of this assessment (see Section 10 – Noise and Vibration).

12.7.6 If a rural area is gradually developed with industrial facilities the level of background noise in that area has the potential to rise progressively over time with each new development. This progressive increase in background noise level is termed as ‘creeping background’. Creeping background noise levels can be avoided by careful assessment at the planning stage for a new development. As such, the noise impact

assessments undertaken as part of the EIA for the proposed Project will consider the available historic background noise data, and use the lowest measured background noise data of all available noise survey information as the baseline assessment conditions for the Project. The intention of this cumulative assessment approach is to assess and mitigate further incremental increases to the background noise climate by new development.

Construction

12.7.7 Construction activity inevitably leads to some degree of noise disturbance at locations in close proximity to the construction activities. It is however a temporary source of noise (between 18 and 36 months). Noise levels at any one location will vary as different combinations of plant and machinery are used, and throughout the construction of the proposed Project as the construction activities and locations change.

12.7.8 Construction activities will not be undertaken outside of the core working hours, these are currently understood to be: weekdays 07:00hrs to 19:00hrs, and Saturdays 07:00hrs to 13:00hrs unless prior agreement is reached with MSDC.

12.7.9 The outline construction noise assessment identifies that the predicted cumulative construction level is below the daytime limit of 65 dB(A), and the evening and weekend limit of 55 dB(A) at all receptors. Therefore, the significance of the overall impact of construction noise is predicted to be minor at all NSR locations and therefore deemed insignificant in EIA terms (as set out in Section 7.4).

12.7.10 Noise generating activities during construction will also be subject to the approved CEMP. This will be secured by a requirement for the submission to and approval by MSDC of a CEMP (an outline of which will be produced as an Appendix to the final ES). In addition, a requirement attached to the DCO will control noise levels at residential locations, and provide for the monitoring of noise levels at these locations during construction.

12.7.11 Construction of the Gas Connection is expected to lead to the generation of some short-term construction noise, primarily from the excavation of the trench in which the pipeline will sit. However, at any one location, the construction activities will only occur for a short period of time as the active working width moves along the gas pipeline route. In some locations the impact will be no greater than that experienced currently with the movement of agricultural machinery. Therefore a preliminary assessment of the significance of noise impacts can be considered as minor.

12.7.12 Given the similarity of the two gas connection route corridor options, there are not considered to be differences in the potential impacts of the different routes.

Operation - Power Generation Plant

12.7.13 The computer noise modelling software CadnaA (Version 4.1), which uses the ISO 9613 propagation algorithms has been used to undertake a provisional noise calculation. The model estimates the contribution to noise levels at each NSR location, and has been created using a representative sound power level for the whole Project.

12.7.14 The model is intended to provide an indicative assessment only for the operational phase of the Project.

12.7.15 The detailed operational noise modelling will be undertaken as part of the EIA, when full details of all plant items will be available.

12.7.16 The predicted noise levels at sensitive receptors from the Project are used to inform the BS 4142 operational noise assessment.

12.7.17 BS 4142 provides a methodology for the assessment of industrial noise in mixed residential and industrial areas. In this case, the standard suggests obtaining an assessment level by comparing the existing background noise levels with the 'rating level', which is the predicted noise output of the Project, corrected to account for any acoustic features such as tonal or impulsive noises. The semantics used for assessing the likelihood of complaints due to the introduction of a new industrial noise source are as follows:

- When subtracting the background level from the rating level, the greater the difference, the greater the likelihood of complaints.
- A difference of around +10 dB or more indicates that complaints are likely.
- A difference of around +5 dB is of marginal significance.
- If the rating level is more than 10 dB below the measured background noise level then this is a positive indication that complaints are unlikely.

12.7.18 The results of the preliminary operational noise assessment show that at all locations the rating level is above the lowest measured

background noise level. Based on the preliminary assessment the impact of operational noise from the Power Generation Plant is considered to be moderate adverse at NSR locations 1, 2, 3, 5 & 6. Whilst at NSR location 4 the impact is considered to be major adverse. The impact (without mitigation) on these receptors from the Power Generation Plant are therefore considered to be significant in EIA terms.

12.7.19 It is noted that the operational noise predictions are subject to change following the detailed noise modelling that will be undertaken during the EIA.

12.7.20 A requirement attached to the DCO will require that an acoustic design report will be submitted to and approved by MSDC prior to commencement of construction. This will ensure that the proposed Project incorporates noise-minimising measures by design. A requirement will provide for the on-going monitoring of noise at the boundary of the proposed Project site boundary to ensure that the specified noise levels for operation are met. There are therefore not anticipated to be any remaining noise impacts following mitigation.

Operation - Gas and Electrical Connections and the Electrical Connection Compound

12.7.21 During operation, there will be small amounts of noise generated by the gas AGI. This may be a low 'hum' noise or 'hiss' type of noise as the AGI regulates the flow of gas from the NTS to the Power Generation Plant.

12.7.22 This noise is rarely perceptible except when in very close proximity to the AGI. Given that there are no residential properties in close proximity to the proposed location for the AGI, an initial assessment is that the operational noise from the AGI would be negligible.

12.7.23 It is possible that a low 'hum' may be audible during operation of the Electrical Connection Compound caused by the flow of electricity through the electrical equipment at the site. However, this noise is usually imperceptible except when within very close proximity or during specific meteorological conditions. An initial assessment is therefore that the operational noise from the Electrical Connection Compound would be negligible.

Decommissioning

12.7.24 Works to decommission the plant and structures on the Power Generation Plant and Gas and Electrical Connections will be similar to those for construction. Therefore, the assessment undertaken for the

construction phase is capable of acting as a proxy in each case for the demolition and decommissioning of the proposed Project. A requirement attached to the DCO secures the submission to and approval by MSDC of a demolition and restoration plan, which will mitigate any effects on public health from the decommissioning of the proposed Project.

Conclusion

12.7.25 Based on the results of the above noise and vibration assessments, it can be concluded that that the proposed Project will have no adverse effects during the construction phase. The preliminary results of the operational noise assessment suggest that noise impacts will range from moderate to major adverse. At this stage, these impacts are considered as significant in EIA terms. However, following further study and assessment of potential mitigation measures, there are not considered to be any significant residual impacts.

12.8 Water Quality and Resources

12.8.1 Section 8 – Water Quality and Section 9 – Geology and Ground Conditions provide the water quality and resources impact assessments to date. The public could be exposed to contaminated water via:

- The recreational use of contaminated water;
- Drinking contaminated drinking water; or,
- Consuming agricultural produce which has come into contact with contaminated water.

12.8.2 Children and the elderly will be most vulnerable to negative health effects.

12.8.3 Exposure to contaminated water can have a wide range of health impacts. For example, acute level exposure to Poly-aromatic hydrocarbons (PAHs) leads to red blood cell damage which can lead to anaemia and a suppressed immune system[11].

12.8.4 Drinking water and surface water quality standards can be used to assess the safety of contamination levels. For example, the maximum

[11] *US Environmental Protection Agency: Available at: http://www.epa.gov/ogwdw/pdfs/factsheets/soc/tech/pahs.pdf (Accessed 07/09/2011).*

allowable concentration of PAHs in drinking water is 0.1 µg/l, with anything above this concentration deemed unsafe if ingested[12].

Construction – whole project

12.8.5 Several construction activities could require the disposal of water from the proposed Project site including wheel washing facilities, welfare facilities and water used for dowsing (e.g. of cutting operations or stockpiles) and surface water runoff, as well as de-watering activities as a result of e.g. foundation excavation.

12.8.6 Construction activities may, if uncontrolled, potentially cause changes to surface water drainage due to the creation of soil piles formed during on-site excavation, levelling and other such on–site works. Impacts would be associated with the potential to alter the efficiency / performance of the existing land drainage systems both on-site and in the vicinity of the proposed Project site.

Operation – Power Generation Plant

12.8.7 During the operation of a SCGT power plant which incorporates air cooling, the use of operational water is minimal, as water is not required for the generation of steam or for cooling.

12.8.8 As such, the water at the site during operation will be primarily for maintenance and domestic sanitation, with a small quantity required for NOx control.

12.8.9 This domestic / sanitary water will be discharged to a new septic tank prior to removal from site for disposal by a suitably licensed contractor.

12.8.10 There will be no uncontrolled discharge to neighbouring watercourses.

12.8.11 The proposed Project site will be predominantly covered with hardstanding and surface water from any potentially contaminated areas will be retained on-site. The surface water drainage system for any areas with the potential for oil contamination of any surface water will feed to sumps and will pass through the oil interceptor / filters prior to discharge to a dedicated surface water holding tank / attenuation pond. The design of the surface and foul water drainage scheme will be subject to approval by the EA and SCC prior to commencement of construction.

[12] *DEFRA: Available at:*

http://dwi.defra.gov.uk/consumers/advice-leaflets/standards.pdf (Accessed 07/09/2011)

12.8.12 Access to the proposed Power Generation Plant site will be strictly controlled and security measures will incorporate suitable fencing and the use of security cameras. These measures will be put in place to ensure controlled access to the proposed Project such that no unauthorised persons will come into contact with any potentially contaminated materials. Therefore no potential pathway exists to impact on public health from contaminated water on-site.

12.8.13 Given the depth (~17 m) and low hydraulic transitivity of the superficial deposits overlying the Principal Groundwater Aquifer in the area, the potential for contaminated water percolating beneath the proposed Project site into the Aquifer is considered negligible.

12.8.14 The handling and storage of chemicals, fuels, oils and lubricants on-site for the purposes of operation will be controlled by a requirement. This provides for the submission to and approval of handling and storage details to SCC prior to commencement of operation of the proposed Project.

Operation - Gas and Electrical Connections and the Electrical Substation

12.8.15 During operation, neither the Gas Connections, Electrical Connections or Electrical Substation require water. There will therefore be no impacts.

Decommissioning – whole project

12.8.16 Works to decommission the plant and structures Project site of the proposed Project will be similar to those for construction. Therefore, the assessment undertaken for the construction phase is capable of acting as a proxy for the demolition and decommissioning of the proposed Project.

12.8.17 The geology and land contamination assessment has adopted this approach. Therefore, the surface water quality impacts from decommissioning on public health will be similar to those for construction. A requirement attached to the DCO secures the submission to and approval by SCC of a decommissioning and restoration plan, which will mitigate any effects on public health from the decommissioning of the proposed Project.

Conclusion

12.8.18 Based on the results of the above assessments, it can be concluded that the proposed Project will result in no significant adverse public health impacts with respect to surface water quality.

12.9 Geology and Land Contamination

12.9.1 Section 9 – Geology and Ground Conditions Pollutants provides the impact assessment for Geology and Land Contamination to date. At this stage, there have been no potential pollutants identified as being present at the proposed Project site. Although no ground investigations have been carried out, the potential for contaminated land to be identified is considered low, given the historic 'green field' agricultural use of the whole Project site including Power Generation Plant and connections.

12.9.2 Soil guideline values can be found on the EA website[13]; these provide guideline daily and mean exposures to contaminants according to land-use (residential, allotment and commercial) and could be used as guidelines against which soil samples could be compared to ensure the safety of future users.

Construction – whole Project

12.9.3 During construction, the existing soil conditions are not anticipated to negatively impact upon construction workers. Potential impacts to health (arising from oral, inhalation or dermal contact with potential contaminants within any made ground) are negated by the implementation of the confirmed mitigation measures (as set out in *Section 9 – Geology and Land Contamination* of this PEIR) at all times. The most relevant of these confirmed measures is the appropriate use of PPE at all times. For this site, when breaking ground, this PPE is likely to include gloves, mask, overalls and eye protection.

12.9.4 Additionally, an outline CEMP will include a suggested protocol to follow in the event of construction workers discovering contaminated material.

12.9.5 Given the history of the Project site (i.e. largely undeveloped greenfield land) it is considered very unlikely that contamination will be encountered during construction.

12.9.6 Potential impacts to public health (human receptors outside of the construction site) will be avoided by implementation of a Site Waste Management Plan, to be secured by a requirement. Measures will also be implemented to prevent the escape of contaminants. This will be secured by the CEMP, which must be approved by SCC prior to commencement of construction.

[13] *Environment Agency Website: Available at:*

http://www.environment-agency.gov.uk/research/planning/64015.aspx (Accessed 07/09/2011)

12.9.7 Successful implementation of the mitigation measures discussed above and in Section 9 – Geology and Land Contamination will result in there being no significant public health impact with regards to land contamination

Operation – Power Generation Plant

12.9.8 The proposed Project site will predominantly comprise buildings and / or areas of hardstanding. A small part of the proposed Project site may be landscaped but no areas of exposed (unvegetated) soils will remain and any landscaped areas will be covered with 600 mm of clean cover. Therefore the potential pathway between any ground contaminants and site users will be broken. It is considered that the potential for direct contact (dermal, oral or inhalation) with any remaining contaminants present beneath the surface is extremely low for future site operatives.

Operation – Gas and Electrical Connections and Electrical substation

12.9.9 During operation, the Gas and Electrical Connections will be buried and ground reinstated above them. Therefore there are not anticipated to be any remaining pollutant linkages. The Substation will be covered in hardstanding and so any pollutant linkages would be broken.

Decommissioning – whole project

12.9.10 Works to decommission the plant and structures on the proposed Project will be similar to those for construction. Therefore, the assessment undertaken for the construction phase is capable of acting as a proxy in each case for the demolition and decommissioning of the Project. The geology and land contamination assessment has adopted this approach. Therefore, the geology and land contamination impacts from decommissioning on public health will be similar to those for construction. A requirement attached to the DCO secures the submission to and approval by SCC of a decommissioning and restoration plan, which will mitigate any effects on public health from the decommissioning of the proposed Project. This could include the retention of the concrete foundations in the ground after decommissioning, thereby preventing the creation of pathways that may cause adverse effects to public health.

Conclusion

12.9.11 Based on the results of the above assessments, it can be concluded that that the proposed Project will result in no adverse public health impacts with respect to geology and contamination.

12.10 Waste

12.10.1 The pathways for the proposed Project to impact upon human receptors will potentially be through:

- Inhalation of emissions from waste; and
- Dermal contact / ingestion of leachate from waste that could contaminate soils.

12.10.2 The proposed Project will operate in full accordance with the WFD, the EPR and the Waste (England and Wales) Regulations 2011 (where relevant). PPL, at all phases of the Project, will seek to apply the waste hierarchy as part of their waste prevention and management policy.

12.10.3 The waste hierarchy consists, in order of preference, of:

- Prevention;
- Re-use;
- Recycling;
- Other recovery (e.g. energy recovery); and
- Disposal.

Construction of Power Generation Plant Electrical Connection, Gas Connection and Electrical Connection Compound

12.10.4 A CEMP will be produced, which provides for the submission of construction method statements and a Site Waste Management Plan for approval by the local authority prior to commencement of construction, secured by a requirement attached to the DCO. Measures will include, amongst others, the stockpiling of excavated spoil and testing for Waste Acceptance Criteria, to determine whether it can be re-used on- or off-site, and the testing and removal, as appropriate, of any water from de-watering activities which will be handled by a suitably licensed waste contractor.

12.10.5 The CEMP will ensure that all construction waste will be dealt with in a manner that complies with relevant legislation and (upon leaving the site) waste will be treated and disposed of by suitably licensed contractors. Where hazardous waste is transported from the proposed Project site, it will be handled in accordance with relevant regulations, and, where necessary, be transported in sealed tankers.

Operation

12.10.6 A feature of the GT technology to be incorporated in the proposed Project is that waste generated should be minimal and will be restricted to the following:

- General office wastes;
- Used GT air intake filters (typically replaced annually);
- Used ion exchange resins or used RO membranes (typically replaced every 5 to 10 years);
- Separated oil / sludge from oil / water separators; and
- Used oil, chemicals or chemical containers.

12.10.7 No waste will be generated through the operation of either Gas Connection or Electrical Connection option, or from the Electrical Connection Compound.

12.10.8 Only small quantities of potentially hazardous waste will be stored on-the Power Generation Plant site at any one time, and any such substances will be held in secured containers to prevent contaminant migration. Closed storage facilities or suitable dampening techniques will be utilised within the Power Generation Plant where emissions of dust etc. from waste are possible. All mitigation measures will be in full accordance with industry good practices.

12.10.9 All waste will be dealt with in a manner that complies with the relevant regulations and (upon leaving the site) waste will be treated and disposed of by suitably licensed contractors.

Waste Classifications

12.10.10 There are a number of steps required in order to determine if a waste is hazardous or non-hazardous, as described in the EA "*Technical Guidance WM2 - Interpretation of the definition and classification of hazardous waste*" (2013).

12.10.11 The revised Waste Framework Directive (rWFD) (2008/98/EC) provides a Europe-wide definition of hazardous waste as, "a waste possessing one or more of the 15 hazardous properties set out in Annex III of the rWFD," and requires the correct management and regulation of such waste. Waste classification is based on the European List of Waste (Commission Decision 2000/532/EC) (formerly the European Waste Catalogue) and the 'hazardous properties' provided in Annex III of the rWFD.

12.10.12 There are three categories of entries in the List of Waste (LoW):

- Absolute entries are automatically considered hazardous;
- Mirror entries are linked entries that are considered hazardous (or non-hazardous) if they contain "dangerous substances" and the waste possesses properties specified in Regulation (EC) 1272/2008 on the classification, labelling and packaging of substances and mixtures; and
- Non-Hazardous entries are neither absolute or mirror entries.

12.10.13 For the wastes identified in Paragraph 12.9.6, the relevant entries of the LoW are presented in Table 12.2.

Table 12.2 - European List of Wastes Entries – General*

Project Waste	LoW Waste Code	Waste Descriptor	Type of Entry
General Office Waste	20 03 01	Mixed municipal waste	Non-Hazardous
Demineralisation Media	19 08 06*	Saturated or spent ion exchange resins	Absolute Hazardous
	19 08 08*	Membrane system waste containing heavy metals	Mirror Hazardous
Oily Water	13 05 02*	Sludges from oil/water separators	Absolute Hazardous
	13 05 03*	Interceptor sludges	Absolute Hazardous
	13 05 04*	Oil from oil/water separators	Absolute Hazardous
	13 05 05*	Oily water from oil/water separators	Absolute Hazardous
Waste Mineral Oil	12 01 06*	Mineral-based machining oils containing halogens (except emulsions and solutions)	Absolute Hazardous
	12 01 07*	Mineral-based machining oils free of halogens (except emulsions and solutions)	Absolute Hazardous
Compressor Wash Fluid	20 01 29*	Detergents containing dangerous substances	Mirror Hazardous
	20 01 30	Detergents other than those mentioned in 20 01 29	Mirror Non-Hazardous

Used Antifreeze	16 01 14* 16 01 15	Antifreeze fluids containing dangerous substances Antifreeze fluids other than those mentioned in 16 01 14	Mirror Hazardous Mirror Non-Hazardous
Laboratory Waste	16 05 06*	Laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals	Mirror Hazardous
Discarded Chemicals	16 05 07* 16 05 08* 16 05 09	Discarded inorganic chemicals consisting of or containing dangerous substances Discarded organic chemicals consisting of or containing dangerous substances Discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08	Mirror Hazardous Mirror Hazardous Mirror Non-Hazardous
Scrap Metal	02 01 10	Waste metal	Non-Hazardous

* Note: Air filters are predominantly made of steel (frames) and plastic / fabric filter materials that are considered non-hazardous. However, power stations in the UK treat these as 'special wastes' (i.e. not 'hazardous') that are removed from site by suitably licensed contractors that have the capacity to process such items.

Decommissioning

12.10.14 A full Environmental Departure Audit will be carried out prior to decommissioning. This will examine, in detail, all potential environmental risks existing at the proposed Project site and make comprehensive recommendations for any remedial action required to remove such risks.

12.10.15 The decommissioning process will be in full accordance with the prevailing legislation, guidance will be followed and the departure audit will be complied with.

12.10.16 Following completion of the demolition, a Final Environmental Departure Audit will be carried out to ensure that all remedial work has been completed successfully; the audit reports will be made available to any future users of the site.

Conclusion

12.10.17 Based on the results of the above assessments, it can be concluded that that the proposed Project will result in no adverse public health impacts with respect to waste.

12.11 Public Health Impacts Conclusion

12.11.1 Based on the results of the above, with the implementation of the proposed mitigation, the construction and operation of the proposed Project will result in no adverse public health impacts associated with the generation or handling of waste.

12.12 Preliminary Assessment of Residual Effects

12.12.1 On the basis of the preliminary environmental information and assessment described above, taking into account potential mitigation measures, there are not predicted to be likely significant effects on waste management and public health as a result of the proposed Project.

SECTION 13

TRAFFIC, TRANSPORT AND ACCESS

13 TRAFFIC TRANSPORT AND ACCESS

13.1 Introduction

13.1.1 This chapter considers the likely significant impacts of the proposed development on the local transport network. A full Transport Assessment (TA) will be prepared as a separate document to accompany the proposed DCO Application. This chapter will report on the relevant findings at this preliminary stage of the assessment.

13.2 Legislative and Policy Context

13.2.1 The following describes the existing policy and transport infrastructure information.

National and Local Policy Statements

13.2.2 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic traffic and transport impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

13.2.3 Whilst the PA 2008 is clear as to the primacy of the relevant NPS, other national and local planning policy can be considered important and relevant by the SoS in the determination of an energy NSIP.

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

13.2.4 This document provides the relevant context in which to undertake Traffic and Transport appraisal. Section 5.13 details the requirements of the assessment and emphasises that “the consideration and mitigation of transport impacts is an essential part of Governments wider policy objectives for sustainable development as set out in Section 2.2 of the NPS”.

13.2.5 The guidance on the conduct of Transport Assessments in England is referenced in NATA/WebTAG and is the Department for Transport’s Guidance on Transport Assessments (2007) and the Highways Agency’s Circular 02/2013 which present a framework for assessing development in the context of its impact on their transportation assets.

National Planning Policy Framework (2012)

13.2.6 This document supersedes various plan documents (including PPG13) in respect of local authority plan making and planning decisions, and sets out principles of sustainable development.

13.2.7 The NPPF states the need for a Transport Statement or Transport Assessment to support developments likely to generate significant numbers of trips. It suggests that development should take advantage of opportunities for sustainable travel, facilitated by a travel plan.

13.2.8 The transport objectives of the NPPF are to

13.2.9 “Facilitate economic growth by taking a positive approach to planning for development”; and

13.2.10 “Support reductions in greenhouse gas emissions and congestion, and promote accessibility through planning for the location and mix of development”.

13.2.11 NPPF States that “All developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment. Plans and decisions should take account of whether:

- the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
- safe and suitable access to the site can be achieved for all people; and improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development.
- Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe”

Guidance on Transport Assessments (March 2007)

13.2.12 This document provides information on how to prepare a TA.

13.2.13 The paper outlines the need for the TA to encourage sustainable access and mitigate residual impacts of vehicles. It states that the goal of a TA is to estimate the impacts of the development and improve accessibility and safety for all modes, using a focus on public transport, walking and cycling.

DfT Circular 02/2013 - The Strategic Road Network and the Delivery of Sustainable Development

13.2.14 The document sets out the way in which the Highways Agency will engage with communities and the development industry to deliver sustainable development and, thus, economic growth, whilst safeguarding the primary function and purpose of the strategic road network. It replaces the policy set out in Department for Transport (DfT) Circular 02/2007 Planning and the Strategic Road Network.

13.2.15 The document states that development proposals are likely to be acceptable if they can be accommodated within the existing capacity of a section (link or junction) of the strategic road network, or they do not increase demand for use of a section that is already operating at over-capacity levels, taking account of any travel plan, traffic management and/or capacity enhancement measures that may be agreed. However, development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

13.2.16 Local authorities and developers will be required to ensure that their proposals comply in all respects with design standards. Where there would be physical changes to the network, schemes must be submitted to road safety, environmental, and non-motorised user audit procedures, as well as any other assessment appropriate to the proposed development. The Design Manual for Roads and Bridges sets out details of the Secretary of State's requirements for access, design, and audit, with which proposals must conform.

A Future for Transport: A Network for 2030

13.2.17 The Department for Transport's White Paper sets out the Government's strategy for transport up to 2030. The publication of this White Paper seeks to bring about improvements to all modes of transport through the creation of a coherent network. It focuses on three key themes of:

- Sustained investment
- Making improvements to transport management, and,
- Planning ahead

13.2.18 In terms of local travel, the document highlights the need to reduce car use by improving public transport services, improving the quality of the local environment and the use of travel plans to ensure that public transport, walking and cycling are seen as attractive alternatives to the car.

Planning for a Sustainable Future (2007)

13.2.19 This White Paper sets out the Government response to the Eddington and Barker reviews, and outlines some reforms to the planning system. Chapter 7 discusses sustainable economic development and the Government's vision for reducing the impact of transport on the environment by reducing car travel.

Suffolk Local Transport Plan – Part 1

13.2.20 Suffolk's third Local Transport Plan – Part 1, published in 2011 details the County Council's transport strategy for the region from 2011 to 2031. The key focus of the plan is to encourage and bring about development within the transport sector that will support Suffolk's economy as it recovers from the recession as well as ensuring future sustainable economic growth.

13.2.21 The Local Transport Plan has four main aims in order to accomplish this, which are:

- Improving the County's transport networks
- Reducing congestion
- Improving access to jobs and markets
- Encouraging a shift to more sustainable travel patterns

13.2.22 These will be essential for businesses in creating access to more jobs for more people, reducing travel costs and encouraging smarter ways to work.

13.2.23 The proposed Project is located within the Mid Suffolk area of the county, and the Suffolk Local Transport Plan highlights several key transport issues for this particular region, which include:

- The cycle network
- Rural bus provision
- Rural footpaths
- Local access to key services
- Lorry management

13.2.24 In order to fulfil these aims and tackle these problems, the Local Transport Plan also outlines the transport strategy for rural areas within Suffolk, which is based around five themes. They are:

- Better accessibility to employment, education and services

- Encouraging planning policies to reduce the need to travel
- Maintaining the transport network and improving its connectivity, resilience and reliability
- Reducing the impact of transport on communities
- Support the county council's ambition of improving broadband access throughout Suffolk

13.2.25 Thus, an overall better relationship between the home, leisure, retail and employment is to be created, with new developments providing facilities that 'promote walking, cycling and local public transport access to local employment sites and wider transport networks'. (LTP3, Part 1, page 14)

Suffolk Local Transport Plan – Part 2

13.2.26 Suffolk's third Local Transport Plan – Part 2, published in 2011 details the County Council's transport implementation plan for the region from 2011 to 2015. The county council's priorities for investment in integrated transport are outlined in Table 13.1 below.

Table 13.1 - SCC's priorities for investment in integrated transport from 2011 to 2015

Town	Indicative type of scheme	Indicative level of expected capital investment 2011 to 2015 (£000)
Beccles	Beccles Loop rail scheme, Beccles southern relief road*, cycle route improvements	5,000*
Brandon	Improvements to local pedestrian and cycle network and to bus facilities	250
Bungay	Townscape enhancement	450
Bury St Edmunds	Intelligent traffic management, pedestrian crossings, cycle route improvements, rights of way improvements	1,200
Felixstowe	Traffic management, cycle route improvements	450
Haverhill	Cycle route improvements, pavement widening, crossings, rights of way	450

	improvements	
Ipswich	Ipswich – Transport fit for the 21st Century. Cycle and bus network improvements beyond centre	21,800
Lowestoft	A12/Commercial Road Improvements, sustainable transport package (subject to successful bids), completion of northern spine road*, cycle and pedestrian improvements	10,000*
Newmarket	Traffic management, crossings, cycle route improvements	450
Stowmarket	Intelligent traffic management, bus, cycle and pedestrian improvements	450
Sudbury	Shared space, pedestrianisation, crossings, cycle route improvements	450
Countywide	Locally determined quality of life	2,600
Safety engineering	Casualty reduction	2,350

*It is likely that either the Beccles southern relief road or completion of the Lowestoft northern spine road can be delivered by 2015.

13.2.27 Consideration will also be given for the following planned projects within Suffolk, as described in further detail in the Transport Assessment:

- Beccles South Relief Road
- Ipswich – Transport for the 21st Century
- Lowestoft 'local links'
- A11 Improvements
- Suffolk Travel Plans
- Fresh Ways to Work
- TravelSmart
- Lowestoft Spine Road
- Cycle City Ambition Grant

13.3 Project Scenario for Assessment

13.3.1 In respect of traffic and transport, the realistic worst case scenario from within the proposed Project parameters (which are described in Section 3 of the PEIR) are set out in Table 13.2 below.

Table 13.2 - Project Scenario for Assessment

Parameters	Details
Power Generation Plant	
Number of gas turbine units	5 (~ 59 MW)
Number of stacks	5
Unit type	Aero derivative

13.3.2 Five separate units are likely to generate marginally more traffic movements, than a 1 or 2 industrial unit configuration, due to the number of deliveries, and overall area for land clearance.

13.3.3 A preliminary assessment of both options for the Gas Connection, the Electrical Connection and the Electrical Connection Compound is presented in this section.

13.4 Assessment Methodology and Significance Criteria

Scope and Contents of the Transport Assessment

13.4.2 A meeting was held on the 24th July 2013 with SCC in order to establish the scope and methodology of the TA and Travel Plan (TP). Minutes of this meeting will be presented in the consultation report that accompanies the proposed DCO Application. All comments raised in the Scoping Opinion and the meeting will be addressed in the TA.

13.4.3 The TA will be undertaken for the proposed DCO Application and will be structured in the following way:

- Policy Context - highlighting how the development fits with national, regional and local policy, and identifying policies that will guide the content of the TA.
- Existing Conditions - details on the surrounding transport network, including committed development and infrastructure in the local area, and the spatial and temporal scope of the traffic impacts.

- Assessment Methodology - a description of the data collection, trip generation and trip distribution methodologies used, and a summary of the assessment outcome.
- Junction Assessment Results: 2013 Base Year - a summary of junction capacity assessments for 2013.
- Junction Assessment Results: Future Year (TBC) Do Nothing - a summary of junction capacity assessments in a future year to be agreed with SCC and the Highways Agency (HA) without the proposed Project.
- Junction Assessment Results: Future Year (TBC) Do Something - a summary of junction capacity assessments in a future year to be agreed with SCC and the Highways Agency with the proposed Project.
- Junction Assessment Results Summary – a summary of the changes between the different assessment scenarios.
- Link Capacity Analysis - an assessment of the capacity of the links across the network.
- Road Safety Analysis - an assessment of the study area accident record.
- Environmental Impacts – an assessment of transport against sensitive receptors
- Mitigation – an outline of potential measures that could mitigate the impact of the proposed Project.
- Conclusion – a summary of the TA findings.

13.4.4 During the scoping process, it was indicated that there will need to be consideration of the transport impacts for the construction, operational and decommissioning phases of proposed Project, and as such these shall be considered within the TA.

Environmental Impact

13.4.5 Potential effects are likely to be most significant for receptors within the local community, and employees at the former Eye Airfield, although any user of the A140 or B1077, or of the local PRoWs around the airfield could be impacted.

13.4.6 The likely effects of the proposed Project in environmental terms will be evaluated in accordance with the Institute of Environmental Assessment's (IEA) 'Guidelines for the Environmental Assessment of

Road Traffic' (1993). This evaluation will be informed by the findings of the Transport Assessment.

13.4.7 The proposed Project may cause potential effects to both motorised and non-motorised users and it will be ensured that effects for all modes of transport are considered.

13.4.8 As further work progresses in the full TA, the transport related environmental effects (as defined by IEA guidelines) can be assessed for the following factors:

- Traffic flows
- Delay
- Road safety
- Intimidation and fear
- Severance
- Pedestrian amenity

13.4.9 Effects may differ, dependent on whether the proposed Project is in its construction, operational, or decommissioning phase.

13.4.10 The effects of traffic in relation to noise and vibration, and air quality will be considered in relevant sections of the EIA.

13.4.11 The following describes how these effects may be caused, the consequences, and how the significance of these effects can be measured.

Traffic Flows

13.4.12 The proposed Project is expected to result in changes in traffic flow for each of its phases since it will occupy land that is currently not occupied by development.

13.4.13 Changes can be considered as having a negative effect if there is a larger traffic flow, which can result in congestion, delay, severance and a polluted, unattractive and stressful environment. A larger traffic flow could be caused by an increase in vehicle demand, or through an increase in the number of HGVs.

13.4.14 Changes may also have a positive effect, if the consequence of the Project is a reduced traffic flow. This for example could be the outcome of one development which presently generates a high volume of traffic being replaced with a much less traffic intense development. Reduced

traffic flows can result in an improvement in congestion, delay and overall amenity of the environment.

13.4.15 IEA provides guidance on how the magnitude of changes in traffic flow should be determined, as shown in Table 13.3

Table 13.3 - Criteria Defining Magnitude of Change in Traffic Flow

Magnitude	Criteria
High	Considerable change in condition (90+%)
Medium	Readily apparent change in conditions (60-90%)
Low	Perceptible change in conditions (30-60%)
Very Low	No discernible change in conditions (0-30%)

13.4.16 The overall significance of change is categorised based on the sensitivity of the receptor as shown in Table 13.4. For many effects, there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on part of the assessor, backed-up by data or quantified information wherever possible. Consultation with stakeholders will enable determination of the sensitivity of each receptor.

Table 13.4 - Classification of Effects

Sensitivity of Receptor	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major	Major / Moderate	Moderate	Moderate / Minor
Medium	Major / Moderate	Moderate	Moderate / Minor	Minor
Low	Moderate	Moderate / Minor	Minor	Negligible

13.4.17 The positive or negative effect of changes may therefore vary across receptors, with some road links experiencing a positive impact or being of low sensitivity, whereas others may have high sensitivity and high magnitude of impact and these will be identified accordingly.

Delay

13.4.18 An increase in delay, i.e. time spent in traffic queues is a negative effect that has repercussions in terms of pollution, accessibility, severance, and driver stress. Increases in delay can be the result of junctions and links operating above capacity, or due to the implementation of speed restrictions.

13.4.19 A decrease in delay is a positive effect that can lead to reductions in pollution and stress and improvements to accessibility and severance. A decrease would most likely be the result of improved junction capacity, either as a result of reduced traffic flow or a reengineered junction.

13.4.20 Through the consultation process, it has been possible to identify the receptors (links or junctions) that are likely to have high sensitivity, and further capacity analysis will enable a quantitative and qualitative determination of any changes in delay likely during any of the phases of the proposed Project.

Road Safety

13.4.21 The proposed Project may have road safety implications, either in terms of an improvement or deterioration of the effect. Road safety has further implications in terms of driver stress, intimidation and fear, and severance.

13.4.22 Analysis within the TA will be able to provide a qualitative assessment of the quantity and cause of accidents and identify any patterns that may be exacerbated or mitigated by the proposed development.

Intimidation and Fear

13.4.23 Intimidation and fear can be caused by a wide range of factors including location, highway layout, level of crime, and driver stress. However as discussed in the IEA guidelines, there are no commonly agreed thresholds for estimating these from other measurable factors.

13.4.24 Therefore a qualitative judgement, based on content of the Transport Assessment including the site audit and non-motorised user assessment would be used to determine the intimidation and fear effect of the proposed Project.

Severance

13.4.25 The IEA guidelines describe severance as perceived division that can occur within a community when it becomes separated by a major traffic

artery. This for example may be a pedestrian unable to cross a road as a result of a large volume of traffic, or the loss of a PRoW or cycle lane.

13.4.26 It will be possible, using the site audit and non-motorised user assessment sections of the TA, to provide a qualitative assessment on the effect the proposed Project has on severance.

Pedestrian Amenity

13.4.27 Pedestrian Amenity is defined within the IEA guidelines as the 'relative pleasantness of a journey'. This is affected by traffic flow, traffic composition, pavement width and separation from traffic.

13.4.28 A qualitative assessment of the effect of the proposed Project on pedestrian amenity can be given using the site audit and non-motorised user assessment included in the TA, with particular consideration given to any key public rights of way identified during the stakeholder consultation process.

13.5 Consultation

13.5.1 Table 13.1 below provides a summary of consultation responses relating to Transport and Infrastructure so far and illustrates how each response has, or will be addressed.

Table 13.5 - Consultation Responses to Date

Reference	Comment	Actions
PLANNING INSPECTORATE		
3.57	The SoS considers it essential to categorise and quantify the type and volume of materials to be removed from the site and identify where potential traffic movements would be routed.	Suitable construction routes will be identified and construction team to advise on volumes of material. This will be detailed in the TA of the ES, whilst a preliminary assessment, using assumptions, is set out in this PEIR.
3.58	The SoS welcomes the proposed consultation with the local highways authority and the Highways Agency (HA) on the assessment of transport impacts, particularly to identify any cumulative impacts.	We will contact the HA to ensure that the assessment considers other schemes which may affect the results and document consultation in the TA of the ES
3.59	The Applicants attention is drawn to the comments received from the local authorities and PHE (see Appendix 2) with regard to inclusion of information within a Transport Assessment (TA),including reference to consideration of non-road transportation impact.	We can confirm that non-road transport will also be considered in the assessment and reported in the ES
3.60	Information should be provided on the types of vehicles and plant to be used, the number of vehicle trips, during the construction and operation phases. This should include vehicular movements required during shut down and maintenance periods.	Largest vehicle to be used will be described along with peak construction trips. Information on likely plant requirements will be provided Maintenance and shut down requirements will be considered. Where detail cannot be defined at the planning stage an indicative range of trips generated will be provided.

		The above will be presented in the ES, whilst a preliminary assessment, using assumptions, is set out in this PEIR.
3.61	The access route to the site has not been confirmed within the Scoping Report. The ES should detail the transport routes to be used during construction and operational phases, both within the site and along the strategic road network. The measures to be employed to ensure that these roads will be utilised should be detailed.	Access to the Power Generation Site will be from Castleton Way Construction access for the Gas Connection options will be as for the Power Generation Plant. Construction access for the Electrical Connection and Electrical Connection Compound cannot be identified until an option has been chosen; however, the preferred access is via Old Norwich Road, which could require upgrade works. Operational access for the Gas Connection will be from Castleton Way.
3.62	The SoS recommends that the ES should take account of the location of footpaths and any public rights of way (PRoW) including bridleways and byways. The ES should clearly set out the impacts on them including within the wider area. It is important to minimise hindrance to them where possible. A clear indication should be given as to how the development will affect the existing and future facilities in the area and what mitigation would be appropriate in the	A review of the existing pedestrian infrastructure is being undertaken. Construction and operational impacts are being considered Mitigation measures will be recommended depending on the impact. This will be included in the TA of the ES.

	short, medium and long term.	
3.63	The SoS welcomes the proposal to produce a Travel Plan for the construction and operational phases of the proposed development. If this is to form a separate document to the ES the Applicant should ensure that sufficient information is contained within the ES for it to be a standalone document.	The TA will raise items that will be considered in the TP. The TP will be submitted as part of the TA of the ES
3.64	The significance of an identified effect from transportation will need to take into account a number of criteria. These criteria will need to be carefully described so that impact significance is clearly defined within the ES and so that it can be clearly understood how significance has been concluded.	This PEIR provides initial details on the classification and magnitude of impacts, and further details of their significance will be provided in the ES.
3.65	Transport of the waste stored temporarily on site should be addressed in terms of the form of transport and the possible routing.	Transport routes and requirements will be considered in the assessment where sufficient detail is available and reported in the TA of the ES.
3.66	Cross reference should be made to the Air Quality, Noise and Vibration, and waste assessments where appropriate.	Cross references will be provided where required in the TA of the ES.
SUFFOLK COUNTY COUNCIL		
48	The ES will need to explain and justify assumptions made within the transport assessment of the application. These should be discussed with SCC in advance of the application.	The scope of the TA and the assessment methodology will be agreed with SCC and detailed in the TA of the ES.
49	The ES will need to provide information on all construction and operational transport. The assumption that the vehicles will mainly be personnel related (5.10.1) seems very unlikely and is not accepted at this point. Information will also be required on vehicles used for materials, delivery and disposal, and construction equipment for all aspects of the construction.	Information will be provided in the TA of the ES on trip numbers for construction and operational transport including vehicles likely to be used for materials, delivery, disposal and construction

50	A profile of vehicle numbers throughout the construction and for typical operation will be required (5.10.2). There will also need to be information on how delivery and shift times will be managed to avoid peak periods along the delivery/commuting routes.	A profile of traffic will be provided in the TA. Information on delivery and shift times will be provided and assessed against peaks,
51	The route for abnormal loads will need to be agreed with SCC Structural Engineering section (5.10.3).	Agreed and to be reported in the TA of the ES
52	Information will need to be provided on the type of vehicle and vehicle movements required for the operational phase (5.10.4), for example related to the tankering of water supplies (see water resources below). Consideration will also then need to be given to the timing of these movements to cause minimal impact on the network. Impact on the local network would also be affected by the introduction of any new access route to the site off the A140.	The operational phase will be assessed as part of the TA. This will include identifying the new trips generated by the site and the impact on the local road network. Consideration will be given to the timing of movements as mitigation if the assessment finds that it is required.
53	The A140 at this location needs to be considered as a corridor rather than a selection of specific junctions (5.10.5 & 5.10.6). This corridor should cover from a point south of the junction of the A140 with Castleton Way to a point north of the junction of the A140 and B1077. Particular attention needs to be assessing the impacts of additional traffic on safety and evaluating the need for any mitigation measures.	A review of safety will be undertaken. Whilst individual junction assessments will be undertaken, the TA will consider the queues and interaction between junctions along the A140. Additionally, we will provide an assessment on existing speeds and likely impacts in the TA of the ES
54	Reference is made to a new access off the A140 (5.10.6); it is not clear if this refers to a permanent access to the site or temporary access for the purpose of the electrical connection work.	Construction access for the Electrical Connection and Electrical Connection Compound cannot be identified until an option has been chosen; however, the preferred access is via Old Norwich Road, which could require upgrade works.

55	The approach set out at paragraph 5.10.7 should not limit the options for mitigation or demand management considered during the transport assessment process. The extent of residual impact will have to be agreed	Approaches to mitigation outside the TA process will be detailed in the ES.
56	The comparison of existing traffic flows should be by vehicle category so that the relative impact of construction related traffic can be assessed (5.10.9). Sufficient traffic data should be obtained to ensure a thorough assessment of transport impacts; the term "if considered necessary" seems to contradict this approach.	Traffic flows will consider the level of heavy vehicles on the road network. Relevant data collection to be agreed with Suffolk County Council and reported in the TA of the ES
57	The ES needs to address the issue of sustainable non motorised access to the site on local roads, in particular the B1077 where there is no dedicated footway to the main site entrance. It should be noted that the impact of the development on all Non- Motorised Users needs to be considered, not just pedestrians (5.10.10). In addition to severance from amenity areas, the assessment also needs to consider NMU's use of the highway network for other uses. Mitigation will be needed to address any significant residual impacts, for example through the upgrade of part of the public footpath network on the airfield site to bridleway to provide a preferable alternative means of access.	The TA will consider the impact for all transport users including pedestrians and cyclists. Desire lines through the study area will be identified to inform where infrastructure improvements may be required. This will be reported in the TA of the ES
58	The sentence "and predicted traffic associated with the development." should be added to paragraph 5.10.11	Predicted traffic will be incorporated into the TA of the ES. A preliminary assessment, using assumptions, is set out in this PEIR.
59	SCC is the highway authority for this area (5.10.12). The Highways Agency should be consulted on potential impacts on the strategic network where this forms part of the delivery route (when it is confirmed where this is). MSDC should be consulted on their understanding of issues and potential sources of additional traffic	Agreed. Discussion will be reported in the TA of the ES

	from developments in the area. For the non-strategic network, SCC should be consulted directly.	
60	The preparation of a travel plan is a key part of assessing potential mitigation and demand management, this needs to form part of this process and not be an add on as suggested by paragraph 5.10.13. The travel plan also needs to be deliverable and enforceable and a draft should be provided with the application. Particular regard should be had to the opportunity to deliver a rail-bus interchange facility at Diss for construction workers, and, more generally to improve connectivity between the site and adjacent employment and residential areas.	A TP will be produced as part of the proposed DCO Application submitted with the TA of the ES. Sustainable modes of travel will be explored and SMART initiatives proposed.
61	With respect to possible cumulative impacts, there is a need to take into account the impact along the proposed delivery routes rather than just the impact of associated developments in the immediate area (5.13.1). SCC can advise on this once the delivery routes are clarified.	Delivery routes will be assessed in the TA of the ES
62	We would expect all the mitigation proposals to be set out in a Code of Construction Practice, a draft of which should be provided with the application. It should include details of traffic routeing, provisions for access and a travel plan. Details of a preconstruction condition survey for the highway (including public rights of way) network will need to be provided and provisions set out for the reinstatement of damage.	Routing, access and travel plan arrangements will be presented in the TA. Detailed design work such as condition surveys and damage assessments would be undertaken as a requirement following the grant of the DCO as details of this are unlikely to be known.
MID SUFFOLK DISTRICT COUNCIL		
	Suffolk County Council is the relevant local highway authority and its comments should be taken into account by the applicants when preparing the ES. The Council would however request that the ES takes into account the impact of the proposals upon existing public rights of way and the needs of pedestrians and cyclists. A Travel	Agreed. To be incorporated in the TA of the ES

	Plan will be required to accompany the proposals in due course.	
EYE TOWN COUNCIL		
p.2	Water Resources; how many tanker movements are involved? What effect will they have on existing A140 traffic volumes?	This will be calculated in the TA.
p.2	Traffic movements and Safety; The potential of such a large workforce during construction, their housing and travel to and from the site should also be investigated. The details of the lorry routes onto and off the site, 'their policing' during construction should also be factored in.	The required number of HGV movements during construction and the likely trip patterns of workers will be calculated and assessed. Construction routes will be considered and reported in the TA of the ES
NATIONAL GRID		
p.3	Pipeline Crossings: Where existing roads cannot be used, construction traffic should ONLY cross the pipeline at previously agreed locations.	It is not anticipated that construction traffic will cross existing pipelines. The new gas pipeline will cross potash lane at two locations which will be specified in the ES
NORFOLK COUNTY COUNCIL		
4.1	The ES/EIA will need to evaluate the impact on the landscape of upgrading existing roads and creating new access routes in the construction and operational phase of the project (including enhanced signage) as all of this can sub-urbanise a rural landscape. It will also need to consider how these should be mitigated, perhaps through removal and reinstatement at the end of the project.	This will be considered in the ES
7.1.1	Vehicles – define the nature of the traffic likely to be generated. In addition for the largest vehicles proposed to use each access route(s) this must include: - • minimum width (including unhindered horizontal space)	This will be confirmed in the TA.

	• vertical clearance • axle weight restriction	
7.1.2	Access & Access Route – description of the route (including plans at an appropriate scale incorporating swept-path surveys). Assessment to include site inspection and details of contact with the appropriate Highway Authority (including the Highways Agency for Trunk Roads where applicable). In addition: - • details of any staff/traffic movements/access routes; • detailed plans of site access/es incorporating sightline provision • confirmation of any weight restrictions applicable on the route together with details of contact with the relevant Bridge Engineer • overhead/ underground equipment – details of liaison with statutory undertakers - listing statutory undertakers consulted together with a copy of their responses • details of any road signs or other street furniture along each route that may need to be temporarily removed/relocated	This will be considered in the TA. A preliminary traffic assessment, using assumptions, is set out in this PEIR.
7.1.3	Impacts during construction – are any special requirements needed and if so provide details e.g.:- • timing of construction works • removal of parked vehicles along the route(s) – full details will need to be provided – including whether or not alternative parking arrangements are being offered or bus services provided in lieu of potential loss of ability to use private cars • removal and reinstatement of hedgerows – since these are usually in private ownership has contact been made with the owners. Has formal legal agreement been reached or are negotiations pending/ in progress • identification of the highway boundary along the construction	We will liaise with relevant planning teams during the development of the application and provide details of special requirements concerning construction in the ES

	traffic route together with verification from the Highway Authority • confirmation of whether the identified route involves the acquisition of third party land and if so has consent been given, (verbal or has a formal legal agreement been entered into) • confirmation of any required third party easements – e.g. will construction vehicles need to overhang ditches (these are usually in private ownership), private hedges or open land adjacent to the highway. If so, details of consent (verbal or a formal written agreement) • any modifications required to the alignment of the carriageway or verges/over-runs • identification of sensitive features along route • trimming of overhead trees – has a survey been undertaken to identify trees that will need to be trimmed and if so what steps have been undertaken to identify the owners of those trees • confirmation of whether any affected trees are covered by a tree preservation order • confirmation of whether any of the verges along the route(s) are classified as SSSI or roadside Nature Reserve status. If so, detail any impact • confirmation of any extraordinary maintenance agreement/s required by the Highway Authority	
7.1.4	Cabling route/grid connection – description of the route/s including plans at an appropriate scale, incorporating, for example: • assessment to include site inspection and details of contact with the appropriate Highway Authority (including the Highways Agency for Trunk Roads where applicable) • traffic details of grid connection enabling works	Agreed. To be incorporated in the TA.

	• NOTE – only statutory undertakers are allowed to place longitudinal apparatus – including cables – within land forming part of the public highway.	
7.1.5	Impacts during operation • details of type and frequency of vehicle to be used to service the facility/structure(s) when in operation • details of any long-term highway impact e.g. will trees and hedgerows need additional trimming to allow access for service vehicles • position of structures relative to public highways and/or public rights of way – the minimum distance of which should be no less than 50m • assessment of any impact on adjacent/affected public rights of way e.g. horses and pedestrians – e.g. with a wind farm are the blades positioned in close proximity to bridleways such that flicker may startle horses	Agreed. To be incorporated in the TA. A preliminary assessment, using assumptions, is set out in this PEIR.
7.1.6	Impacts during decommissioning – define the expected life span of the facility/structure(s). • provide details of decommissioning works including an assessment of whether or not the structure is to be scrapped - i.e. can it be broken up on site and removed or will it require the same logistical process as initial construction.	Agreed. To be incorporated in the TA. A preliminary assessment, using assumptions, is set out in this PEIR.
YAXLEY PARISH COUNCIL and THRANDESTON PARISH COUNCIL		
6	A full assessment is needed of the almost inevitably increased accident risk at the staggered crossroads on the A140 where Castleton Way runs eastwards to Eye and Eye Road runs westwards into Yaxley. An increase in traffic volume, which is likely to be significant during the three-year construction phase, will put	A review of safety at the junction is being undertaken to identify any existing safety issues. The trips generated by the proposed Project will be distributed onto the network

	an added load onto this already hazardous junction. It will be necessary to assess not just the extent of the increased traffic but also to give a breakdown of the direction from which it approaches the junction. Vehicles arriving from the south will generate a greater accident risk than those from the north. Mitigation measures should be devised.	which will allow the impact on individual locations to be calculated. This will be presented in the TA of the ES
6	In paragraph 5.10.5 on page 115 of the scoping report it mentions that the vehicular access to the site will be 'via the A140, entering the site from the south via Castleton Lane [sic] and Potash Lane'. Potash Lane is on the eastern side of the airfield and is accessible only via the B1077. There is presently no vehicular route within the airfield from the end of Potash Lane to the proposed site. If there is any intention of opening an access route here to enable a route through from the B1077 to the site, further assessment and mitigation will be necessary at the junction of the B1077 and the A140, which is probably even more hazardous than the one further south.	There is no intention to open an access to the east of the site at this stage. Where reference to Potash Lane is made in the Scoping Document, it is in reference to the former air strip which runs north/ south across the airfield, not the road to the south of the compression station. The impact of any new access points on adjacent junctions will be assessed fully in the TA and a preliminary assessment, using assumptions, is set out in this PEIR.

13.6 Baseline Conditions and Receptors

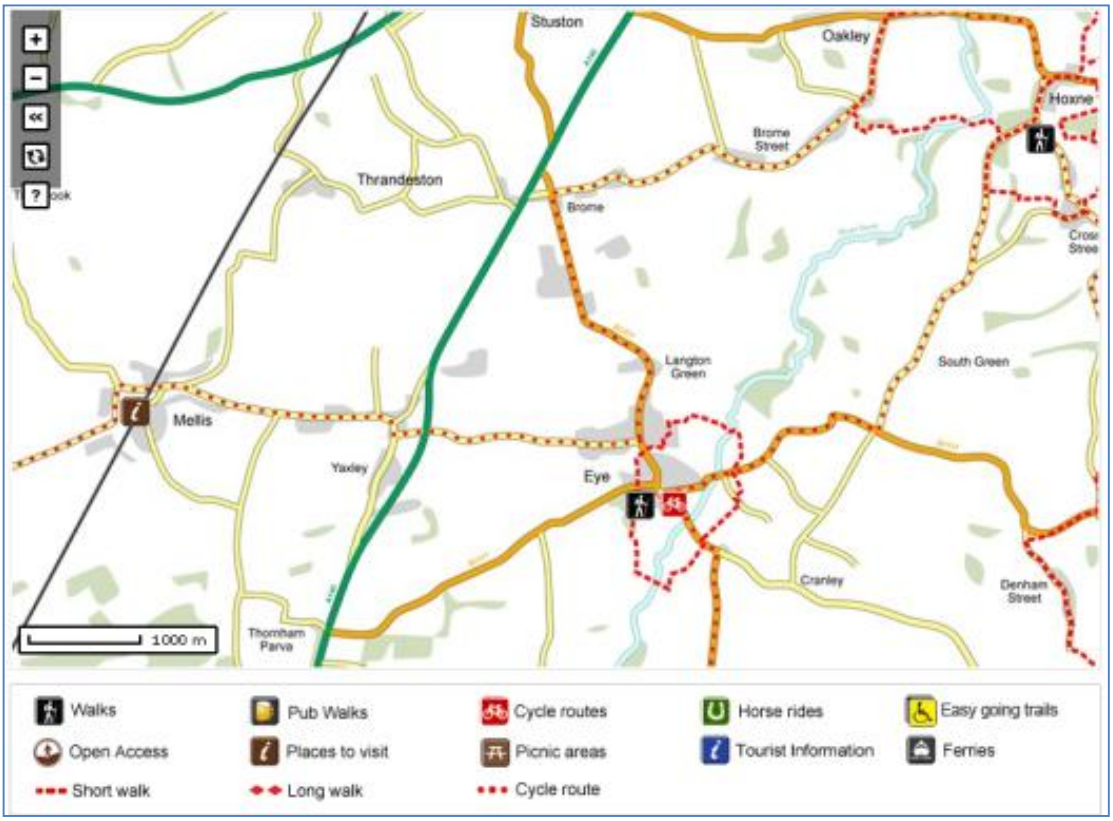
Pedestrian and Cycle Facilities

13.6.2 Castleton Way is part of National Cycle Route 30. Eye town centre is also one end of regional route 40, which runs between Eye and Framlington. Insert 13.1 shows the cycle routes within the vicinity of the site. Insert 13.2 shows cycle routes as part of a promotional leaflet, 'Cycling Around Eye' (MSDC).

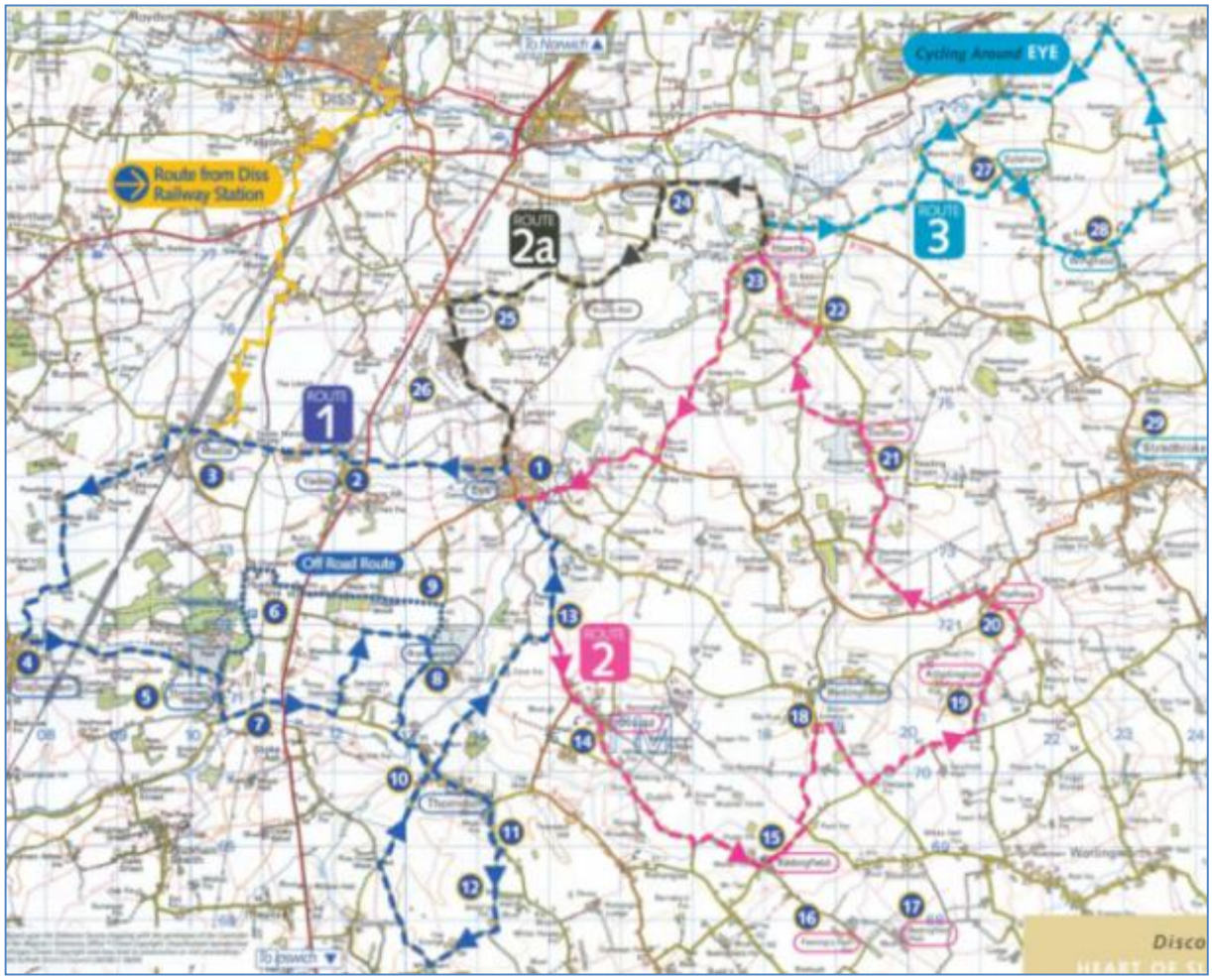
13.6.3 There is limited footpath provision on the A140 and Castleton Way adjacent to the site. The town of Eye has good footpath provision; however, there is no continuity to the Power Generation Plant. Insert 13.3 shows the existing footpath provision in the area.

13.6.4 The proposed Project site has a number of PRoW that are poorly connected and there is evidence of fragmentation and re-routing of the historic connections. The TA will incorporate impacts on the PRoWs into the assessment.

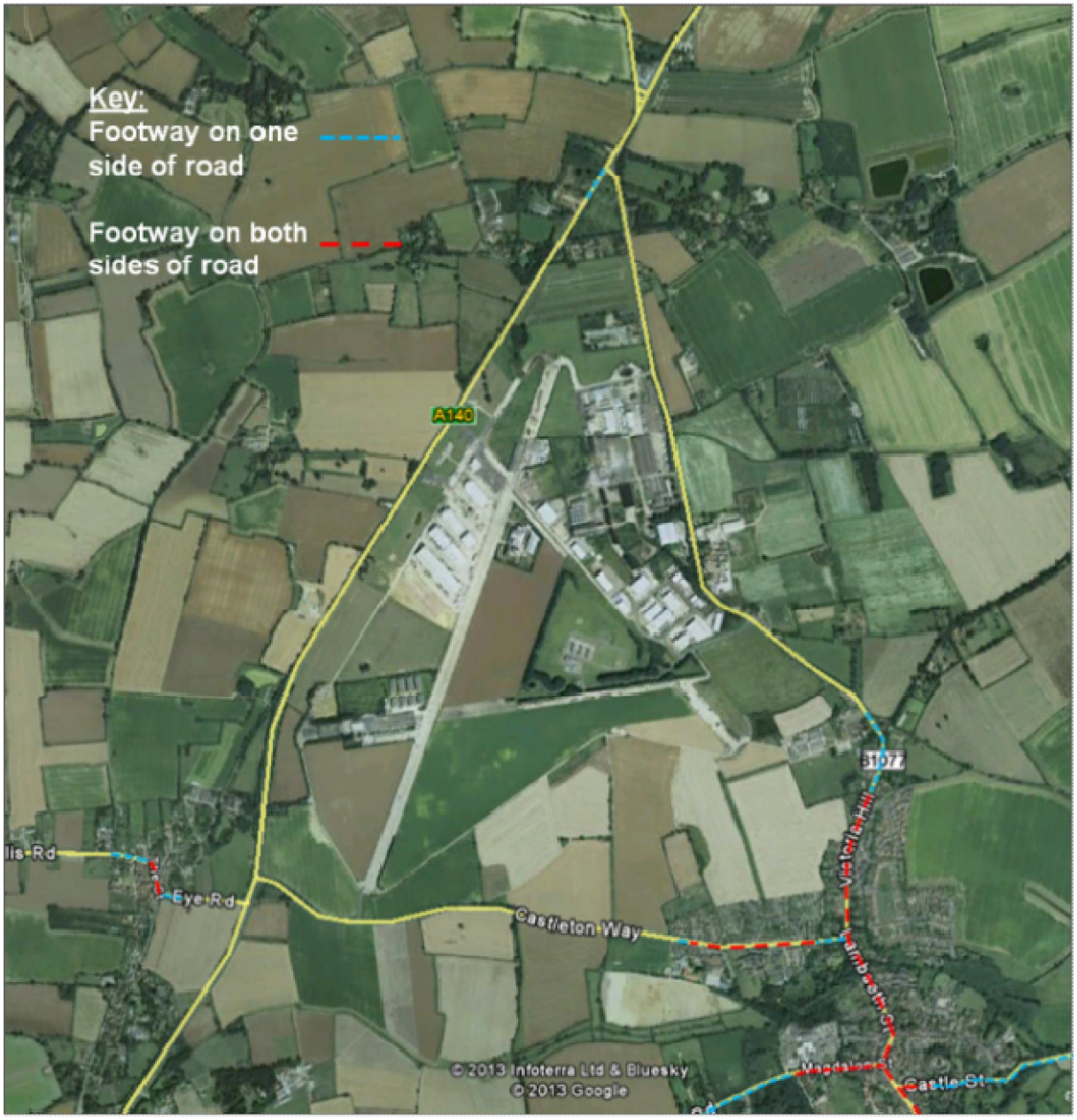
Insert 13.1 Cycle route provision within the vicinity of the site (source: SCC Website)



Insert 13.2 - Cycle route provision within the vicinity of the site (source: Cycling Around Eye, MSDC))



Insert 13.3 - Footway provision within the vicinity of the site

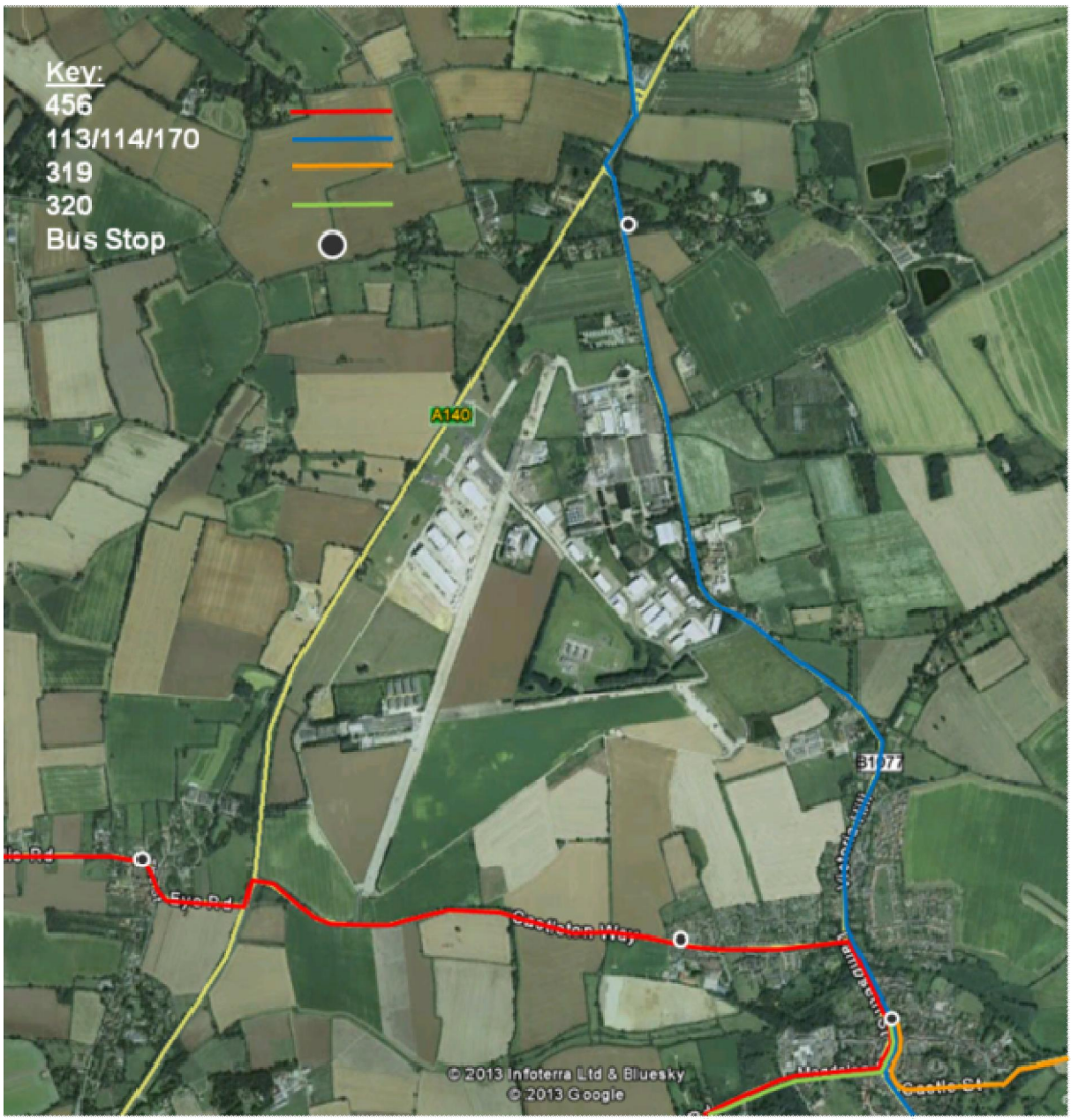


Bus Services

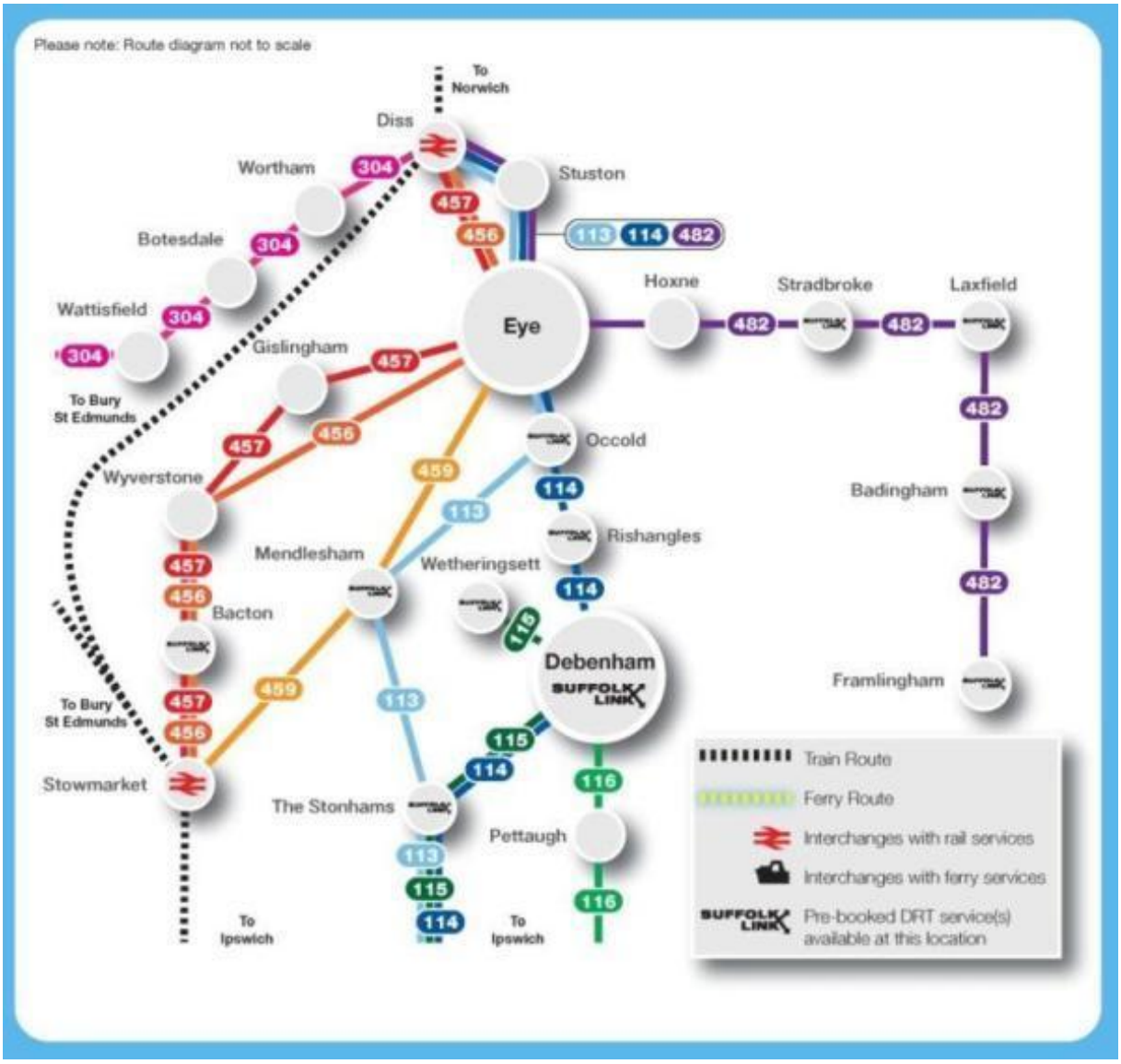
13.6.5 There are a limited number of routes and bus stops in the vicinity of the Project Site with no routes penetrating the airfield itself. A regular bus service exists (the 113/114) which provides an hourly service form Ipswich to Diss via Eye. Other services provide access to nearby villages including the 456/457, which provides 3 to 4 buses per day to Diss, Finningham, Mendlesham and Stowmarket. The 170 operates only during the school summer holidays and is restricted to one morning and evening service daily.

13.6.6 Insert 13.3 to Insert 13.6 show the existing Public Transport Provision within the area.

Insert 13.4 - Public Transport provision within the vicinity of the Site



Insert 13.5 - Public Transport provision – wider coverage (source, Suffolk on Board website)



Rail Services

13.6.7 Diss is the nearest railway station, and is an important local transport hub approximately 5 km north of the former Airfield. The rail station can be accessed using the 113/114 hourly bus service. The bus stop on Victoria Road from Diss Station is approximately 400 m.

13.6.8 There are cycle stands and lockers at Diss Station, a Taxi rank and a Station Car Park. Rail services are managed by Greater Anglia and there is one service per hour to London and Norwich, also serving Stowmarket and Ipswich, from which it is also possible to catch half-

hourly local trains to intermediate stations, and trains west to Cambridge and to Peterborough

13.6.9 Insert 13.6 shows the train station and parking facilities.

Insert 13.6 - Train station and parking facilities at Diss

Parking Provision

13.6.10 There will be car parking provided within compound areas for the Power Generation Plant and the Electrical Connection Compound. The proposed Project will consider the council's policy on parking standards during the operational phase of the development and reflect a desired shift to sustainable transport methods.

Highway Network

13.6.11 As shown in Insert 13.7 the site is located adjacent to the A140, which is a major transport route from which the national road network is easily accessible. The road runs north-south linking Ipswich and Norwich. Approximately 3 km north of Eye, the A140 joins the A143. The A143 provides access to Lowestoft and Great Yarmouth to the east and to Bury St Edmunds in the west.

13.6.12 The A140 is a 50 mph single carriageway road, reducing to 40 mph at the northern end of former Eye Airfield on the approach to the Thrandeston Road. The speed limits on the road network are described in Insert 13.7

13.6.13 The existing employment uses on the former Eye Airfield are accessed via the B1077. From the South, the B1077 is accessed via a dedicated

right turn lane which is signed as shown in Insert 13.8. From the North, access is via a left turn. Rectory Road also provides access from the A140, forming a smaller triangle north of the airfield with the A140 and the B1077, however, this route is not encouraged given lack of signing for this direction.

13.6.14 Castleton Way runs from the south-west corner of the airfield eastwards into Eye and is an unrestricted country road for the majority of its length until it reaches Eye, where the speed limit turns to 30 mph.

Insert 13.7 - Highway Network Speed Limits and Junction Assessment Locations

Insert 13.8 - Right Turn Access from A140 to B1077

Junctions

13.6.15 Specific junctions to be assessed have been identified through consultation with SCC and the assessment will include the following junctions, as shown in Insert 13.9.

- A140 / Stuston Lane
- A140 / B1077 Priority Junction (North)
- A140 / B1077 (Rectory Road) Priority Junction (North)
- A140 / Castleton Way
- A140 / Eye Road

Access

Power Generation Plant

13.6.16 Access to the proposed Power Generation Plant site during construction and operation will be from Castleton Way via the existing junction to the south of the air strip. No other vehicular access will be provided to and from the site, although emergency access will be provided from the north through the industrial estate if necessary.

13.6.17 Access to / from Castleton Way will be mainly via the A140. This access can be seen in Insert 13.9 from the south.

Insert 13.9 - Right Turn Access from A140 to Castleton Way

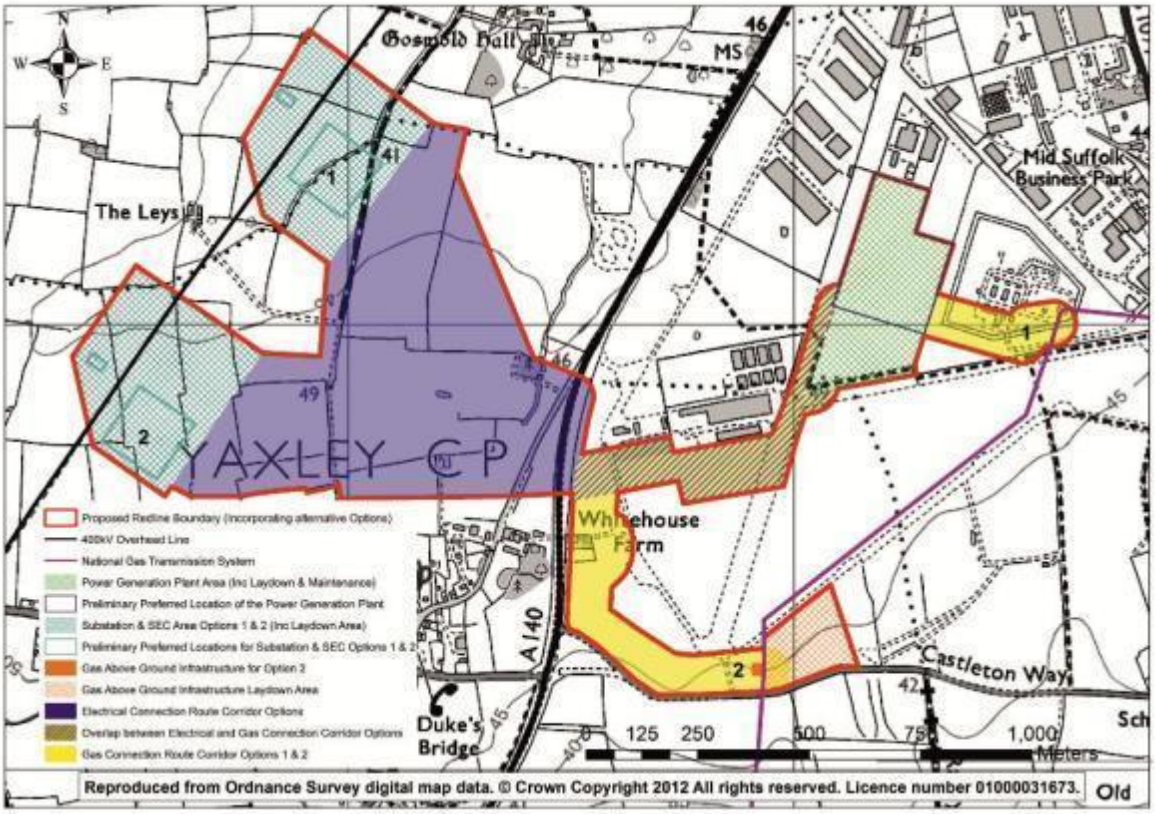
Gas Connection and AGI Access

13.6.18 Access to the Gas Connection (Option 1 or 2) will be the same as that for the Power Generation Plant described above.

Electrical Connection and Electrical Connection Compound Access

13.6.19 The Electrical Connection to the National Grid is proposed to run from the Power Generation Plant site on the former Eye Airfield, across the A140, to the Electrical Connection Compound in the west where it will connect to the overhead lines approximately 2 km from the Power Generation Plant site

13.10- Electrical Connection and Electrical Connection Compound



13.6.20 The Electrical Connection is proposed to run underground along a linear route corridor which will be constructed as part of the Project. During construction, there will be a requirement to undertake work on the A140, Old Norwich Road and Leys Lane as the corridor will run across these roads.

13.6.21 The linear route corridor will run across existing fields to the Electrical Connection Compound. The preferred access for construction staff and vehicles to the substation and electrical route connection is via A140 / Eye Road and then via Old Norwich Road during construction. A full assessment of suitable access arrangements and alternatives will be undertaken as part of the TA. A permanent access road would be

required to provide maintenance vehicles with a route to the Electrical Connection Compound. The location of this road is subject to further development. This and other alternatives will be assessed in the final ES, with the preferred option being the same as that for construction.

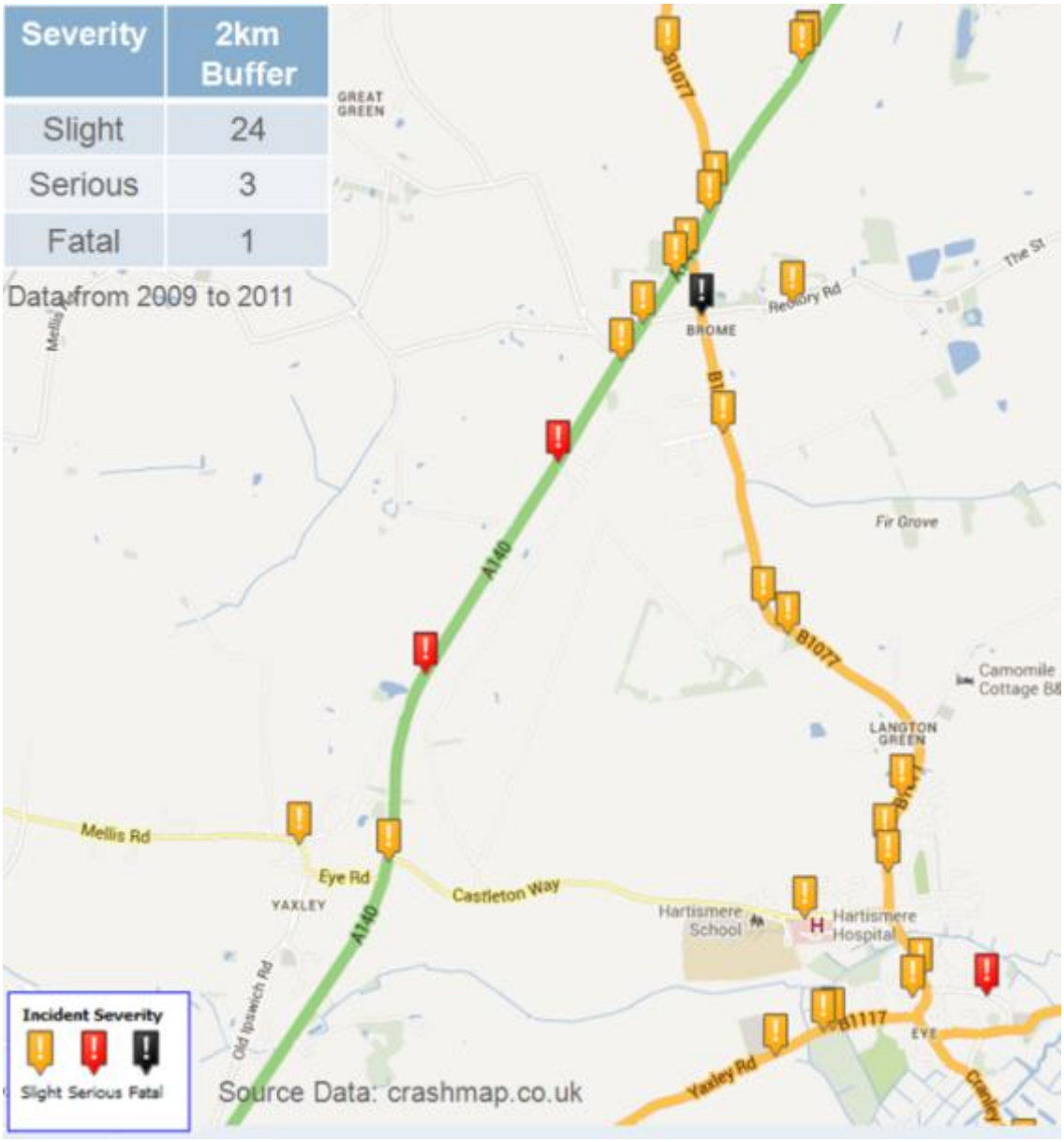
Road Safety and Collisions

13.6.22 There have been a total of 28 collisions in a three year period from 2009 to 2011 on this part of the A140. The majority (24) are classed as slight collisions, and are concentrated at junctions in the area. Eight of the slight collisions occurred along a 0.6 km section either side of B1077 on the A140. Several other slight collisions occurred along the B1077, with one at an entrance way into the Eye Airfield industrial estate; two at a bend in the road just north of the entrance to Progress Way, and two between Century Road and Bellands Way in Langton Green.

13.6.23 Two of the three serious collisions within the 2 km buffer of the proposed development site occurred along the A140. One of these collisions occurred at a local private access and involved two vehicles, and one casualty. The other occurred approximately 0.7 km north of the A140 junction with Castleton Way, and involved two vehicles, with three casualties. The third serious collision took place within Eye, along Church Street and involved one vehicle and one casualty. One fatal collision occurred within the 2 km buffer with one casualty and involved four vehicles at Brome crossroads.

13.6.24 Insert 13.11 shows the distribution of these accidents across the area.

Insert 13.11 - Road Accidents (source: Crash Map website)



13.6.25 It will be necessary to obtain the most up to date available accident data to assess the road safety implications of the development for the full TA.

13.7 Preliminary Assessment of Potential Impacts

13.7.1 The TA will establish the existing capacity and speed conditions around the Project Site and assess junction and corridor performance in relation to a number of receptors. This will be based on data collected on the Project site (anticipated September 2013) and existing data.

13.7.2 The TA will present the findings of trip estimates from the proposed Project, construction, operation and decommissioning of the proposed Project, the mode split of all trips, and the likely distribution across the transport network. A number of junction assessments will be undertaken and forecasting of baseline traffic data will be carried out to establish a 'do minimum' scenario for a future year.

13.7.3 The impact of the proposed Project, construction, operation and decommissioning of the proposed Project will be established by adding trips associated with the development to the 'do minimum' scenario to create a 'do something' and the impacts will be presented in the TA. If necessary, mitigation measures will be proposed to reduce the number of trips, or provide capacity to cater for these additional trips.

13.7.4 A TP will be created and adopted in which sustainable transport will be promoted throughout the life cycle of the proposed Project.

13.7.5 The main transport impacts are likely to be limited to the peak construction times in the Project programme and this is likely to be only for a temporary duration during construction. As the only route into the Power Generation Plant site and Gas Connection is via Castleton Way, constraint on junction performance is likely to occur at this junction although this qualitative assessment will be tested fully in the Transport Assessment.

13.7.6 In relation to the Gas Connection, Electrical Connection and Electrical Connection Compound, it is anticipated that temporary and permanent road construction would be required to facilitate access of vehicles, both abnormal loads, and smaller service vehicles, to the Electrical Connection Compound and trenching works for the Gas Connection and Electrical Connection Again, this qualitative assessment will be appraised fully in the Transport Assessment.

13.7.7 A provisional assessment of the likely impacts for each of the elements of the Project is presented below.

POWER GENERATION PLANT

Construction

13.7.8 There is likely to be an increase of traffic on the A140 as construction workers travel to and from the Power Generation Plant site and HGV's access the Power Generation Plant site. Additionally, the junction of Castleton Way is likely to have increased demand as this junction will be on the route to the Power Generation Plant.

13.7.9 Abnormal loads are unlikely to cause any significant impacts on the road network as routes, delivery times and street furniture assessments will be planned to accommodate abnormal loads and this will be agreed with SCC prior to undertaking.

Operation

13.7.10 There will be minimal impacts during the operation of the Power Generation Plant as operational staff numbers will be relatively low and the delivery and removal of goods to the site are expected to be low during the day.

Decommissioning

13.7.11 The decommissioning stage will be similar to the construction phase in that a number of construction staff will be required to decommission the Power Generation Plant. Therefore, there is likely to be an increase of traffic on the A140 as construction workers travel to and from the site and HGV's access the site. Additionally, the junction of Castleton Way is likely to have increased demand as this junction will be on the route to the Power Generation Plant.

GAS CONNECTION ROUTE CORRIDOR OPTION 1

Construction

13.7.12 The number of construction workers required to construct the Gas Connection Option 1 will be low in relation to the Power Generation Plant. As such, there is likely to be limited impacts associated with additional trips on the network. There will be some additional traffic caused by the arrival and departure of construction workers and HGV's delivering and removing goods from the corridor. However, this is anticipated to be low.

Operation

13.7.13 Maintenance vehicles are expected to be infrequent and are not anticipated to cause any detriment to the local transport network. Access to the Gas Connection Route Corridor Option 1 will be via Castleton Way and Potash Lane.

Decommissioning

13.7.14 The decommissioning stage will be similar to the construction phase in that a number of construction staff will be required to decommission the Gas Connection Corridor Option 1. However, as with construction, the number of workers required to construct the Gas Connection Corridor

Option 1 will be low and as such, there is likely to be limited impacts associated with additional trips on the network.

GAS CONNECTION ROUTE CORRIDOR OPTION 2

Construction

13.7.15 The number of construction workers required to construct Gas Connection Corridor Option 2 will be low in relation to the Power Generation Plant. As such, there is likely to be limited impacts associated with additional trips on the network. There will be some additional traffic caused by the arrival and departure of construction workers and HGV's delivering and removing goods from the corridor, however, this is anticipated to be low.

13.7.16 There will be a requirement to undertake temporary road works across Potash Lane, although the impacts of this will be managed through temporary traffic management arrangements and the impacts are likely to be negligible.

Operation

13.7.17 Maintenance vehicles are expected to be infrequent and are not anticipated to cause any detriment to the local transport network Access to the Gas Connection Option 2 will be via Castleton Way and Potash Lane. Any other access to the corridor will be within private land.

Decommissioning

13.7.18 The decommissioning stage will be similar to the construction phase in that a number of construction staff will be required to decommission the Gas Connection Option 2. However, as with construction, the number of workers required to decommission the Gas Connection Option 2 will be low and as such, there is likely to be limited impacts associated with additional trips on the network.

13.7.19 There may be a requirement to undertake temporary road works across Potash Lane, although the impacts of this will be managed through temporary traffic management arrangements and the impacts are likely to be negligible.

ELECTRICAL CONNECTION COMPOUND OPTION 1 AND ELECTRICAL CONNECTION OPTION 1

Construction

13.7.20 The number of construction workers required to construct the Electrical Connection Compound and Electrical Connection Option 1 will be low in relation to the Power Generation Plant. As such, there is likely to be limited impacts associated with additional trips on the network. There will be some additional traffic caused by the arrival and departure of construction workers and HGV's delivering and removing goods from the corridor. The impacted roads are A140, Eye Road, The Street and Old Norwich Road.

13.7.21 A new access road would be constructed to allow access from the preferred option of Old Norwich Road along the corridor to the Electrical Connection Compound. This will cater for all vehicle types including abnormal loads. Abnormal load routing, delivery schedule and street furniture considerations will be agreed with SCC officers in advance of undertaking.

13.7.22 Temporary traffic management will be required as the Electrical Connection Option 1 runs across the A140, Old Norwich Road and Leys lane. Consideration will be given to off peak traffic working over the A140 to limit adverse impacts on traffic.

Operation

13.7.23 Maintenance vehicles are expected to be infrequent and are not anticipated to cause any detriment on the local transport network. Access to the Electrical Connection Compound could be via a new access road from the preferred option of Old Norwich Road which could also cross Leys Lane.

Decommissioning

13.7.24 The decommissioning stage will be similar to the construction phase in that a number of construction staff will be required to decommission the Electrical Connection Compound and Electrical Connection Option 1. However, as with construction, the number of workers required to decommission the site will be low and as such, there is likely to be limited impacts associated with additional trips on the network.

13.7.25 Abnormal load routing, delivery schedule and street furniture considerations will be agreed with SCC officers in advance of undertaking.

13.7.26 Any temporary traffic management to accommodate decommissioning will be planned and agreed with SCC to ensure impacts are limited on the network.

ELECTRICAL CONNECTION COMPOUND OPTION 2 AND ELECTRICAL CONNECTION OPTION 2

Construction

13.7.27 The number of construction workers required to construct the Electrical Connection Compound and Electrical Connection Option 2 will be low in relation to the Power Generation Plant. As such, there is likely to be limited impacts associated with additional trips on the network. There will be some additional traffic caused by the arrival and departure of construction workers and HGV's delivering and removing goods from the corridor. The impacted roads are A140, Eye Road, The Street and Old Norwich Road.

13.7.28 A new access road would be constructed to allow access from the preferred option of Old Norwich Road along the corridor to the Electrical Connection Compound. This will cater for all vehicle types including abnormal loads. Abnormal load routing, delivery schedule and street furniture considerations will be agreed with SCC officers in advance of undertaking.

13.7.29 Temporary traffic management will be required as the Electrical Connection Option 1 runs across the A140, Old Norwich Road and Leys lane. Consideration will be given to off peak traffic working over the A140 to limit adverse impacts on traffic.

Operation

13.7.30 Maintenance vehicles are expected to be infrequent and are not anticipated to cause any detriment on the local transport network. Access to the Electrical Connection Compound could be via a new access road from the preferred option of Old Norwich Road which could also cross Leys Lane.

Decommissioning

13.7.31 The decommissioning stage will be similar to the construction phase in that a number of construction staff will be required to decommission the Electrical Connection Compound and Electrical Connection Option 2. However, as with construction, the number of workers required to decommission the site will be low and as such, there is likely to be limited impacts associated with additional trips on the network.

13.7.32 Abnormal load routing, delivery schedule and street furniture considerations will be agreed with SCC officers in advance of undertaking.

13.7.33 Any temporary traffic management to accommodate decommissioning will be planned and agreed with SCC to ensure impacts are limited on the network.

13.8 Potential Mitigation / Management Techniques

13.8.1 Once further work has been undertaken for the EIA, it will be possible to identify any highway works, or provision for non-motorised users, based on the findings of the assessment. If any are identified as the Project progresses, then these will be taken into account in the assessment of impacts.

13.8.2 Physical mitigation could be temporary, dependent on whether impacts are linked to the construction or operational phases of Project. A TP will be produced to promote sustainable travel to and from the site.

13.9 Preliminary Assessment of Residual Effects

13.9.1 On the basis of the preliminary environmental information and assessment described above, taking into account potential mitigation measures, the potential residual impacts are detailed in Table 13.6 below.

Table 13.6 - Preliminary Assessment of Residual Effects

Description	Detail	Unmitigated Potential Impact	Mitigation / Monitoring Measure	Residual Impact
Power Generation Plant				
Construction	Construction worker traffic travelling to and from Site	Increased traffic levels on A140 and junction of Castleton Way	Travel Plan measures to reduce the number of vehicles on the road network	Moderate impact on A140 and Castleton Way junction
	HGV construction traffic	Increased traffic levels on A140 and junction of Castleton Way	Delivery timings to be monitored to reduce impacts on congestion issues on the A140 and Castleton Way	Depending on the results of the monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles and potential impact on street furniture	Abnormal load routing will be agreed with SCC officers and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival	Minor disruption to the road network during off peak times
Operation	Operational worker traffic travelling to and from site	Low numbers of workers expected so negligible impact on surrounding	Travel Plan measures to ensure workers have choices for travel	Negligible impact on surrounding road network

		road network		
Decommissioning (similar to construction)	Construction worker traffic travelling to and from site	Increased traffic levels on A140 and junction of Castleton Way	Travel Plan measures to reduce the number of vehicles on the road network	Moderate impact on A140 and Castleton Way junction
	HGV construction traffic	Increased traffic levels on A140 and junction of Castleton Way	Delivery timings to be monitored to reduce impacts on congestion issues on the A140 and Castleton Way	Depending on the results of the monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles and potential impact on street furniture	Abnormal load routing will be agreed with SCC officers and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival and replaced once complete	Minor disruption to the road network during off peak times
Gas Connection Route Corridor Option 1				
Construction	Construction worker traffic travelling to and from site	Low / minor increase of traffic levels on A140 and Castleton Way Junction	Site compound to be located within the Power Generation Plant and journeys to Gas Connection 1 from the Power Generation Plant are within	Low / minor increase of traffic levels on A140, Castleton Way

			private land.	
	HGV construction traffic	Low increase of traffic levels on A140 and Castleton Way Junction	Delivery timings to be monitored to reduce impacts at peak times.	Depending on the results of the monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles on A140 and Castleton Way Junction	Abnormal load routing will be agreed with SCC officers and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival and replaced once complete	Minor planned disruption to the road network during off peak times
Operation	Maintenance vehicles expected to be infrequent	Very low additional traffic on the network	None required	Negligible impact on surrounding road network
Decommissioning (similar to construction)	Construction worker traffic travelling to and from site	Minor increase of traffic levels on A140 and Castleton Way junction	Travel Plan measures to reduce the number of vehicles on the road network. Site compound to be located within the Power Generation Plant and journeys to the Gas Connection to be optimised	Low / minor increase of traffic levels on A140 and Castleton Way junction

			to reduce the number of vehicles on the road network	
	HGV construction traffic	Low increase of traffic levels on A140 and Castleton Way Junction	Delivery timings to be monitored to reduce impacts at peak times.	Depending on the results of the monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles on A140 and Castleton Way Junction	Abnormal load routing will be agreed with SCC officers and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival and replaced once complete	Minor planned disruption to the road network during off peak times
Gas Connection Route Corridor Option 2				
Construction	Construction worker traffic travelling to and from site	Minor increase of traffic levels on A140 and Castleton Way junction	Travel Plan measures to reduce the number of vehicles on the road network. Site compound to be located within the Power Generation Plant and journeys to the Gas Connection to be optimised	Low / Minor increase of traffic levels on A140 and Castleton Way junction

			to reduce the number of vehicles on the road network	
	Road works over access road (Potash Lane)	Road works over Potash Lane during the construction of the gas connection causing negligible impacts	Temporary traffic management plan	Negligible impacts
	HGV construction traffic	Low increase of traffic levels on A140 and Castleton Way junction	Delivery timings to be monitored to reduce impacts at peak times.	Depending on the results of the monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles on A140 and Castleton Way Junction	Abnormal load routing will be agreed with SCC officers and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival	Minor planned disruption to the road network during off peak times
Operation	Maintenance vehicles expected to be infrequent	Very low additional traffic on the network	None required	Negligible impact on surrounding road network
Decommissioning (similar to	Construction worker traffic travelling to	Minor increase of traffic levels on A140 and	Travel Plan measures to reduce the number of	Low / Minor increase of traffic

construction)	and from Site	Castleton Way junction	vehicles on the road network. Site compound to be located within the Power Generation Plant and journeys to the Gas Connection to be optimised to reduce the number of vehicles on the road network	levels on A140 and Castleton Way junction
	HGV construction traffic	Low increase of traffic levels on A140 and Castleton Way junction	Delivery timings to be monitored to reduce impacts at peak times.	Depending on the results of the monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles on A140 and Castleton Way junction	Abnormal load routing will be agreed with SCC officers and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival and replaced once complete	Minor planned disruption to the road network during off peak times
Electrical Connection Compound 1 and Electrical Connection 1				
Construction	Construction worker traffic travelling to	Moderate increase of traffic levels on A140,	Travel Plan measures to reduce the number of	Minor / moderate increase of traffic

	and from site	Eye Road, The Street and Old Norwich Road	vehicles on the road network. Site compound to be located within the Power Generation Plant and journeys to the Electrical Connection to be optimised to reduce the number of vehicles on the road network	levels on A140, Eye Road, The Street and Old Norwich Road
	Road works over A140, Old Norwich Road and Leys Lane during trenching works	Road works over A140, Old Norwich Road and Leys Lane during the construction of the electrical connection causing moderate impacts on A140 and low impacts on Leys Lane and Old Norwich Road	Temporary traffic management plans. Consider off peak road works for A140 to minimise disruption.	Minor impacts on A140. negligible impacts on Old Norwich Road and Leys Lane
	HGV construction traffic	Increased traffic levels on A140 Eye Road, The Street and Old Norwich Road	Delivery timings to be monitored to assess need to reduce impacts at peak times.	Depending on the results of the monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles on Eye Road,	Abnormal load routing will be agreed with SCC officers	Minor planned disruption to the

		The Street and Old Norwich Road. Potential impact on street furniture	and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival and replaced once complete	road network during off peak times
Operation	Operational worker traffic travelling to and from Site to the Substation via Old Norwich Road and a new Road leading to the Substation	Very low numbers of vehicles anticipated – limited impact on road network.	Gated access to substation required.	Negligible impact on surrounding road network
Decommissioning (similar to construction)	Construction worker traffic Travelling to and from Site	Increased traffic levels on A140 and junction of Castleton Way	Travel Plan measures to reduce the number of vehicles on the road network	Limited impact on A140 and Castleton Way junction
	HGV construction traffic	Increased traffic levels on A140 Eye Road, The Street Old Norwich Road	Delivery timings to be monitored to reduce impacts at peak times.	Depending on the results of the monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles on Eye Road, The Street and Old	Abnormal load routing will be agreed with SCC officers and this will ensure planned	Minor planned disruption to the road network during

		Norwich Road. Potential impact on street furniture	routes are agreed and adhered to and any street furniture is removed prior to arrival and replaced once complete	off peak times
Electrical Connection Compound 2 and Electrical Connection 2				
Construction	Construction worker traffic travelling to and from site	Moderate increase of traffic levels on A140, Eye Road, The Street and Old Norwich Road	Travel Plan measures to reduce the number of vehicles on the road network. Site compound to be located within the Power Generation Plant and journeys to the Electrical Connection to be optimised to reduce the number of vehicles on the road network	Minor / moderate increase of traffic levels on A140, Eye Road, The Street and Old Norwich Road
	Road works over A140, Old Norwich Road and Leys Lane during trenching works	Road works over A140, Old Norwich Road and Leys Lane during the construction of the electrical connection causing moderate impacts on A140 and low impacts on Leys Lane and Old Norwich Road	Temporary traffic management plans. Consider off peak road works for A140 to minimise disruption.	Minor impacts on A140. negligible impacts on Old Norwich Road and Leys Lane
	HGV construction traffic	Increased traffic levels on A140 Eye Road, The	Delivery timings to be monitored to assess need	Depending on the results of the

		Street and Old Norwich Road	to reduce impacts at peak times.	monitoring, HGV traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles on Eye Road, The Street and Old Norwich Road. Potential impact on street furniture	Abnormal load routing will be agreed with SCC officers and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival and replaced once complete	Minor planned disruption to the road network during off peak times
Operation	Operational worker traffic travelling to and from Site to the Substation via Old Norwich Road and a new Road leading to the Substation	Very low numbers of vehicles anticipated – limited impact on road network.	Gated access to substation required.	Negligible impact on surrounding road network
Decommissioning (similar to construction)	Construction worker traffic Travelling to and from Site	Increased traffic levels on A140 and junction of Castleton Way	Travel Plan measures to reduce the number of vehicles on the road network	Limited impact on A140 and Castleton Way junction
	HGV construction traffic	Increased traffic levels on A140 Eye Road, The Street Old Norwich	Delivery timings to be monitored to reduce impacts at peak times.	Depending on the results of the monitoring, HGV

		Road		traffic could arrive and depart during off peak times resulting in reduced impact during peak times
	Abnormal Loads	Obstruction for normal vehicles on Eye Road, The Street and Old Norwich Road. Potential impact on street furniture	Abnormal load routing will be agreed with SCC officers and this will ensure planned routes are agreed and adhered to and any street furniture is removed prior to arrival and replaced once complete	Minor planned disruption to the road network during off peak times

13.10 Next Steps

13.10.1 The objective of the TA is to determine the impact of all phases of the proposed Project on users of all modes of transport. This will make it possible to develop appropriate mitigation measures that will minimise adverse transportation impacts for those impacted.

13.10.2 Following the Scoping Opinion responses and the meeting held with SCC, items raised in the Scoping Opinion and during the Meeting will be addressed in the full TA. The following main assessments will be undertaken as part of this next stage of the appraisal:

- Identification of the scope and boundary of construction works, site operations and site decommissioning. This will include details on enabling highways works, staff arrangements, types of vehicles, and means of access.
- Estimation of the number of trips generated during peak periods for each development phase. These will be agreed with SCC and derived from use of the TRICS database where appropriate, or will alternatively be based on staffing and construction/service vehicle requirements.
- Assessment of traffic growth on junctions and links in the study area. This would involve use of a gravity model to establish the origin and destination of Project traffic. It would be necessary to compare the 2013 base year with a future year do nothing scenario (without Project) and a future year do something scenario (with Project).
- Junction capacity analysis, through modelling of junctions identified as having high traffic growth, or identified as requiring consultation through the stakeholder meetings. This would be done for the 2013 base year, and the future year do nothing and do something scenarios. This will inform the need for any junction improvements.
- Link capacity analysis of key corridors to the proposed Project. This will identify the need for any road improvements.
- A non-Motorised user assessment will provide a qualitative assessment of the impacts faced by non car users, i.e. an assessment of the proposed Project impact on pedestrian amenity and severance
- A more comprehensive review of accident data to identify any safety issues and offer mitigation, where appropriate.
- A review of the access arrangements for Abnormal Loads and any temporary mitigation measures required to enable their travel to the proposed Project site.

SECTION 14

CULTURAL HERITAGE AND ARCHAEOLOGY

14 CULTURAL HERITAGE AND ARCHAEOLOGY

14.1 Introduction

14.1.1 The construction, operation and decommissioning of the proposed Project has the potential to significantly impact upon both surface and buried archaeological assets, as well as having an impact upon the setting and appreciation of assets of Cultural Heritage importance, including surrounding Listed Buildings, Scheduled Monuments and Conservation Areas.

14.1.2 At this PEIR stage of the assessment, an archaeological DBA has been undertaken which investigates all historical records within 1 km of the initial Project Redline Boundary as it was presented in the EIA Scoping Report. The assessment identified 47 Heritage Assets within this DBA Study Area and its 1 km Study Area. A total of 72 Listed Buildings were also identified including two Grade I Listed Buildings, six Grade II* Listed Buildings and 64 Grade II Listed Buildings. A total of 43 findspots reported to the Portable Antiquities Scheme have also been recovered within the 1 km Study Area.

14.1.3 This section presents the findings of the DBA and provides a summary of the remaining work that is planned prior to completion of the ES.

14.2 Legislative and Policy Context

National Policy Statements

14.2.2 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic historic environment impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

14.2.3 NPS EN-1 at section 5.8 sets out assessment principles relevant to energy NSIPs in relation to the historic environment. .

14.2.4 Paragraph 5.8.1 of the NPS states that the construction, operation and decommissioning of energy infrastructure has the potential to result in adverse impacts on the historic environment. The following paragraph (5.8.2) defines the historic environment as including all aspects of the environment resulting from the interaction between people and places

through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, landscaped and planted or managed flora. Those elements of the historic environment that hold value to this and future generations because of their historic, archaeological, architectural or artistic interest are called heritage assets. The policy states that a heritage asset may be any building, monument, site, place, area or landscape, or any combination of these. The sum of the heritage interests that a heritage asset holds is referred to as its significance.

14.2.5 Paragraph 5.8.3 discusses statutory designated heritage assets and suggests such categories are: a World Heritage Site; Scheduled Monument; Protected Wreck Site; Protected Military Remains, Listed Building; Registered Park and Garden; Registered Battlefield; Conservation Area; and Registered Historic Landscape (Wales only).

14.2.6 Paragraph 5.8.4 goes on to highlight that there are heritage assets with archaeological interest that are not currently designated as scheduled monuments, but which are demonstrably of equivalent significance. These include those that have yet to be formally assessed for designation; those that have been assessed as being designatable but which the SoS has decided not to designate, and those that are incapable of being designated by virtue of being outside the scope of the Ancient Monuments and Archaeological Areas Act 1979. Furthermore, in Paragraph 5.8.5 the policy considers that the absence of designation for such heritage assets does not indicate lower significance. If the evidence before the Secretary of State indicates to it that a non designated heritage asset of the type described in 5.8.4 may be affected by the proposed development then the heritage asset should be considered subject to the same policy considerations as those that apply to designated heritage assets.

14.2.7 In paragraph 5.8.6 the section concludes that the Secretary of State should also consider the impacts on other non-designated heritage assets, as identified either through the development plan making process (local listing) or through the Secretary of State's decision making process on the basis of clear evidence that the assets have a heritage significance that merits consideration in its decisions, even though those assets are of lesser value than designated assets.

14.2.8 The policy considers (Paragraph 5.8.8) that as part of the applicant's assessment the applicant should provide a description of the significance of the heritage assets affected by the proposed development and the contribution of their setting to that significance. The level of detail should be proportionate to the importance of the heritage assets and no more than is sufficient to understand the potential impact of the proposal on the heritage asset. As a minimum

the applicant should have consulted the relevant Historic Environment Record and assessed the heritage assets themselves using expertise where necessary according to the proposed development's impact.

14.2.9 Paragraph 5.8.9 is concerned with heritage assets with an archaeological interest and states that the applicant should carry out appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation.

Other National and Local Policy

14.2.10 Whilst the PA 2008 is clear as to the primacy of the relevant NPS, other national and local planning policy can be considered important and relevant by the Secretary of State in the determination of an energy NSIP.

14.2.11 National planning policies on the conservation of the historic environment are also set out in the NPPF, which was published by the DCLG in 2012. Sites of archaeological or cultural heritage significance that are valued components of the historic environment and merit consideration in planning decisions are grouped as 'Heritage Assets'. The NPPF states that "Heritage Assets are an irreplaceable resource" the conservation of which can bring "wider social, cultural, economic and environmental benefits..." (DCLG 2012, Section 12: 126). It also states that the "...significance of any Heritage Assets affected including any contribution made by their setting..." should be understood in order to assess the potential impact (DCLG 2012, Section 12: 128). In addition to standing remains, Heritage Assets of archaeological interest can comprise sub-surface remains and, therefore, assessments should be undertaken for a site with potential below ground archaeological deposits.

14.2.12 NPPF draws a distinction between designated Heritage Assets and other remains considered to be of lesser significance; "... great weight should be given to the asset's conservation. Substantial harm to or loss of a Grade II listed building, park or garden should be exceptional. Substantial harm to or loss of designated Heritage Assets of the highest significance, including scheduled monuments, protected wreck sites, battlefields, Grade I and II* listed buildings and Grade I and II* registered parks and gardens and World Heritage Sites, should be wholly exceptional..." (DCLG 2012, Section 12: 132). Therefore, preservation in situ is the preferred course in relation to such sites unless exceptional circumstances exist.

14.2.13 It is normally accepted that non-designated sites will be preserved by record, in accordance with their significance and the magnitude of the

harm to or loss of the site as a result of the proposals, to "...avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposals..." (DCLG 2012, Section 12: 129). Non-designated Heritage Assets of archaeological interest will also be subject to the policies reserved for designated Heritage Assets if they are of equivalent significance to scheduled monuments (DCLG 2012, Section 12: 132).

14.2.14 The Practice Guide to PPS5 remains in force, having accompanied PPS5 (2010) whose policies were incorporated, some modified, into the NPPF in 2012.

Mid Suffolk District Council

14.2.15 The MSDC DPD was adopted in September 2008. Following a review carried out in late 2012, the adopted Core Strategy DPD should be read in conjunction with the 'Core Strategy Focused Review (December 2012)'.

14.2.16 The relevant policy is "Core Strategy Objective SO 4 – To protect, manage, enhance and restore the historic heritage / environment and the unique character and identity of the towns and villages by ensuring that new developments are appropriate in terms of scale and location in the context of settlement form and character".

14.2.17 However, not all the DPDs within the LDF have been completed and adopted and the Local Plan (adopted 1998) contains some 'saved' policies including the following:

14.2.18 Policy HB1 (Protection of Historic Buildings): The district planning authority places a high priority on protecting the character and appearance of all buildings of architectural or historic interest. Particular attention will be given to protecting the settings of listed buildings.

14.2.19 Policy HB8 (Safeguarding the Character of Conservation Areas): Priority will be given to protecting the character and appearance of Conservation Areas and the district planning authority will expect new building, alterations or other forms of development to conserve or enhance their surroundings. Similar care will be taken when considering proposed development on land which lies adjacent to a conservation area. In particular, the protection of significant views into and from the Conservation Area is regarded as a material consideration and will be safeguarded.

14.2.20 Policy HB13 (Protecting Ancient Monuments): The district planning authority will refuse proposals for development that adversely affect

scheduled ancient monuments or other monuments of national importance including their settings.

14.2.21 Policy HB14 (Ensuring archaeological remains are not destroyed) states that where there is an overriding case for preservation, local authority planning permission for development that would affect an archaeological site or its setting will be refused. It also provides that that having taken archaeological advice, the local planning authority may decide that development can take place subject to either satisfactory measures to preserve the archaeological remains in situ or for the site to be excavated and the findings recorded. In appropriate cases the local planning authority will expect a legally binding agreement to be concluded or will impose a planning condition requiring the developer to make appropriate and satisfactory provision for the excavation and recording of the archaeological remains.

14.2.22 The EADF (February 2013) recognises at section 2.9 that the former Eye Airfield is a heritage site and describes the setting, history and reproduces the historic environment record of the area covered by the development brief. It explains the county archaeologist's likely expectations as to field evaluation and other forms of evaluation, recording and mitigation. This would likely comprise a programme of archaeological investigation, with the investigation phase comprising geophysical survey and then targeted evaluation (trial trenching).

Approach

14.2.23 Standards and Guidance: The proposed Project Environmental Impact Assessment Scoping Report (PRO-4100-PB-ENV-RPT-R40 Parsons Brinckerhoff 2013) proposed the undertaking of a Desk-based Assessment, and consequently this document has been written to comply with the Guidance and Standards for Desk-based Assessments in compliance with NPS EN-1 and the National Planning Policy Framework (See Section 3.1, above). Furthermore, the assessment was carried out in accordance with the relevant professional guidelines - Institute for Archaeologists (IfA) and English Heritage (IfA 2012a Standard and Guidance for Archaeological Desk-based Assessments; IfA 2012b Code of Conduct; English Heritage 2006 Management of Research Projects in the Historic Environment (MoRPHE)).

14.2.24 Following the Scoping Report, consultations were carried out with English Heritage and the County Archaeologist at SCC. The scoping responses outlined the study areas for the desk-based assessment and the cultural heritage section, provided information on sites of archaeological significance and a proposed mitigation strategy. This has been adhered to within this report.

14.2.25 Study Area: This DBA has focused on the proposed Project Site, although historic information for the immediate surrounding area (hereafter known as the 1 km Study Area) has been considered in order to provide an essential contextual background, in accordance with the Scoping Report and in consultation with the SCC County Archaeologist.

14.2.26 Terminology: The technical terminology applied to the assessment process in this document is based on that contained within the Cultural Heritage Section (Volume 11, Section 3, Part 2) of the DMRB issued by the HA in 2007. This has been widely adopted throughout the heritage industry as a baseline. However, the terminology has been enhanced as appropriate throughout this report.

14.2.27 Cultural Heritage comprises scheduled monuments, listed buildings, parks and gardens, battlefields, conservation areas, earthworks and buried archaeological remains. For the ease of presentation in this document cultural heritage features are referred to as Heritage Assets, and additionally for the purposes of clarity a minor distinction is made between standing remains and archaeological sites.

14.2.28 Aims: The DBA studies the historic environment within the agreed study area. It consists of an analysis of data in order to identify the likely Heritage Assets, their significance, character of the study area and consideration of the setting of the Heritage Assets, and the nature, extent and quality of the known or potential archaeological, historic, architectural and aesthetic interest. Significance is to be judged in a local, regional, national or international context as appropriate (IfA 2012a).

14.2.29 Objectives: The specific objectives of this DBA are to:

- Assess the potential for Heritage Assets to survive within the proposed Project Site and Study Area;
- Assess the significance of the known or potential Heritage Assets;
- Identify the potential impact of proposed or predicted changes on the significance of the assets and their settings;
- Provide strategies for further evaluation where the nature, extent or significance of the resource is not sufficiently well defined;
- Suggest strategies to conserve the significance of the Assets and their settings, and;
- Present proposals for appropriate archaeological mitigation.

14.3 Project Scenario for Assessment

14.3.1 In respect of cultural heritage and archaeology, the realistic worst case scenario from within the proposed Project parameters (which are described in Section 3 of the PEIR) are set out in Table 14.1 below.

Table 14.1 - Worst Case Scenario for Assessment

Parameters	Details
Number of gas turbine units	5 (~ 59 MW)
Number of stacks	5
Unit type	Aero derivative

14.3.2

14.3.3 The reason that the parameters identified above represent the realistic worst case in relation to cultural heritage and archaeology impacts are due to the larger foot print in comparison to a scenario with fewer GTGs. This larger land take would inevitably result in greater ground disturbance and potential to affect buried archaeology. It is estimated that there would be no material difference on the impact on the setting of cultural heritage assets between any of the other potential scenarios.

14.3.4 A preliminary assessment of both options for the Gas Connection, Electrical Connection and the Electrical Connection Compound are presented in this section.

14.4 Assessment Methodology and Significance Criteria

14.4.1 Data Collection: The principal sources of information consulted were historical and modern maps, although published and unpublished secondary sources were also reviewed. The following repositories were consulted during the data-gathering process:

- Suffolk County Historic Environment Record (HER);
- Catalogue of aerial photographs held by the National Monuments Record (NMR);
- Literature review of publicly available data including reports on any cultural heritage or archaeological work conducted in or near the study area;
- Historical maps including Ordnance Survey.

14.4.2 Site Visit: The Project Site was visited in order to assess its character, identify visible historic features and assess possible factors which may affect the survival or condition of known or potential assets. A

photographic record was compiled as a part of the site visit and a selection of these are presented as Plates 9-16. All of the Heritage Assets identified through the data collection and the site visit are described in detail in the gazetteer (Section 5). Their location is shown on Figure 14.1.

14.4.3 Setting of the Assets: The Project Site and its 1 km Study Area were visited in order to allow a preliminary assessment of the potential for indirect impacts on the setting of the Heritage Assets. At this stage a drive through of the relevant landscape was undertaken, and an outline photographic archive compiled. The general topography was noted, as was the presence of any large areas of tree plantation, and building complexes such as housing estates, industrial plant, and so forth. However, due to the preliminary nature of this assessment, a realistic worst-case scenario is presented. This outline assessment will highlight the need for further more detailed assessment of setting at a later stage as appropriate.

14.4.4 Significance: Initially, the significance of the Heritage Assets is judged in a neighbourhood, local, regional, national and international context, which results in the cultural value or sensitivity of the asset being determined along with the appropriate form of mitigation (Table 14.2, below). Once the value is established then the archaeological, historic, architectural and aesthetic interests are discussed (Section 5, below).

Table 14.2 - Criteria used to Determine Importance of Sites

Cultural value / Sensitivity	Criteria	Mitigation
Very high (international)	World Heritage Sites; Sites of International Importance.	To be avoided
High (National)	Scheduled Monuments; All Listed Buildings; Registered Parks and Gardens.	To be avoided
Medium (Regional / County)	Conservation Areas containing buildings that contribute significantly to its historic character; Areas of Archaeological Importance; Locally listed buildings.	Avoidance recommended
Low (Local / Borough)	Archaeological sites and remains with a local or borough interest for education, cultural appreciation, locally listed buildings; Assets which contribute to local or cultural understanding of the area.	Avoidance recommended
Negligible (Neighbourhood / Negligible)	Relatively numerous types of remains, of some local importance; Isolated findspots with no context; Areas in which investigative techniques have revealed no, or minimal, evidence of archaeological remains, or where previous large-scale disturbance or removal of deposits can be demonstrated.	Avoidance not envisaged
Uncertain /Potential	Potential archaeological sites for which there is little information. It may not be possible to determine the importance of the site based on current knowledge. Such sites are likely isolated findspots, place names or cropmarks identified on aerial photographs.	Avoidance unnecessary

14.4.5 Table 14.2 is a general guide to the attributes of Cultural Heritage Assets and it should be noted that not all the qualities listed need be

present in every case and professional judgement is used in balancing the different criteria.

14.4.6 In order to consider the archaeological and historic significance in particular, an additional set of criteria are employed which relate to the SoS's criteria for assessing the national importance of monuments, as contained in Annex 1 of the policy statement on scheduled monuments produced by the Department of Culture, Media, and Sport (2010). These criteria relate to period, rarity, documentation, group value, survival/condition, fragility/vulnerability, diversity, and potential and are presented in Section 5. The consideration of the significance of statutory designated assets including listed buildings is reflected in their Grade, and so it is not necessary to apply the criteria mentioned to this type of Heritage Asset.

14.4.7 Potential Impact: In order to assess the potential impact of any future development on built heritage or buried archaeological remains, consideration has been afforded to:

- Assessing in detail any impact and the significance of the effects arising from any future development of the Scheme Area;
- Reviewing the evidence for past impacts that may have affected the archaeological sites of interest identified during the desk-based assessment;
- Outlining suitable mitigation measures, where possible at this stage, to avoid, reduce, or remedy significant adverse impacts.

14.4.8 Key impacts have been identified as those that would potentially lead to a change to the Heritage asset. Each potential impact has been determined as the predicted deviation from the baseline conditions, in accordance with current knowledge of the site and the proposed development. The impact is assessed in terms of the sensitivity or value of the asset to the magnitude of change or potential scale of impact during the proposed development. The magnitude, or scale of an impact is often difficult to define, but will be termed as substantial, moderate, slight, or negligible, as shown in Table 14.3, below.

Table 14.3 - Criteria used to Determine Potential Scale of Impact

Magnitude of Impact	Description
Substantial	Significant change in environmental factors; Complete destruction of the site or feature; Change to the site or feature resulting in a fundamental change in ability to understand and appreciate the resource and its cultural heritage or archaeological value/historical context and setting.
Moderate	Significant change in environmental factors; Change to the site or feature resulting in an appreciable change in ability to understand and appreciate the resource and its cultural heritage or archaeological value/historical context and setting.
Slight	Change to the site or feature resulting in a small change in our ability to understand and appreciate the resource and its cultural heritage or archaeological value/historical context and setting.
Negligible	Negligible change or no material changes to the site or feature. No real change in our ability to understand and appreciate the resource and its cultural heritage or archaeological value/historical context and setting.

14.4.9 The interaction of the potential scale of impact (Table 2) and the importance or value of the Heritage Asset (Table 1) produces the impact significance. This may be calculated by using the matrix shown in Table 14.4:

Table 14.4 - Impact Significance Matrix

VALUE		No Change	Negligible	Slight	Moderate	Substantial
	Very High	Neutral	Slight	Moderate / large	Large / very large	Very large
	High	Neutral	Slight	Moderate / slight	Moderate / large	Large / very large
	Medium	Neutral	Neutral / slight	Slight	Moderate	Moderate / large
	Low	Neutral	Neutral / slight	Neutral / slight	Slight	Slight / moderate
	Negligible	Neutral	Neutral / slight	Neutral / slight	Neutral / slight	Slight
		Significance of the Impact				

14.4.10 It is normal practice to state that impacts of moderate significance or above are regarded as significant impacts. Mitigation measures as appropriate for each Heritage Asset affected are presented in section 14.15. Residual impacts are then assessed to determine if there are any likely significant environmental effects following mitigation having been applied.

14.4.11 Limitations: This assessment is based on the proposed Project as presented at the time of compiling this report. Changes to the proposed Project and any additional technical data made available will be considered in any further assessment of the scheme, for instance the ES Cultural Heritage Chapter.

14.4.12 Accessibility to all parts of the proposed Project Site and its 1 km Study Area was restricted, especially in the north-eastern section due to the presence of industrial developments.

14.5 Embedded Design Mitigation

14.5.1 The proposed Project has been designed from the outset to ensure its impacts are minimised. This includes mitigation that is embedded into the design of the Power Generation Plant, Gas Connection, Electrical Connection and Electrical Connection Compound and industry standard methods and procedures to ensure impacts from construction, operation and decommissioning are minimised. In respect of cultural heritage and archaeology this mitigation includes:

- Choice of SCGT technology which allows for shorter stacks, thus reducing the impact on the setting of Cultural Heritage Assets.
- The refinement of the connection routes within the corridors to avoid archaeological assets where possible.

14.5.2 The assessment in this Section takes such design mitigation into account. Any additional mitigation developed in response to specific impacts identified in this assessment is described in paragraph 14.9 below.

14.6 Consultation

14.6.1 Table 14.5 below presents a review of the consultation responses received following publication of the Scoping Report.

Table 14.5 - Consultation Responses

Comment	Actions
PLANNING INSPECTORATE	
SoS Planning inspectorate Scoping Opinion; Study areas to be agreed with EH and LPA; detailed names and characteristics of important heritage assets that could be potentially affected; Define such assets in ES plans; Impacts on setting of cultural heritage resource to be addressed in the ES	Study areas agreed. Detailed assessment / identification completed. Plans completed. Impact on setting to be addressed in the ES. A preliminary assessment of impact is detailed in this PEIR.
ENGLISH HERITAGE EASTERN REGION	
All aspects of the historic environment to be considered; in particular requires detailed assessment of setting	All aspects of the historic environment have been considered - known and potential Impact on setting to be addressed in the ES. A preliminary assessment of impact is detailed in this PEIR.
SUFFOLK COUNTY COUNCIL	
Historic environment (Archaeology only) - The ES should include 1.a Cultural Heritage Desk-based Assessment and Visual Impact Assessment. 2 .Archaeological evaluation to include geophysical survey and trial trenching	1. Draft desk-based assessment and rapid visual impact assessment. 2. Production of draft method statement for Archaeological evaluation. 3. Archaeological Evaluation to be completed in ES

14.7 Baseline Conditions and Receptors

14.7.1 The following section presents a summary of the historical and archaeological background of the general area. This is presented by historical period (Table 14.6) and has been compiled in order to place the study area into a wider archaeological context.

Table 14.6 - Summary of British Archaeological Periods and Date Ranges

Period	Date Range
Prehistoric Period: Palaeolithic Mesolithic Neolithic Bronze Age Iron Age	 30,000 – 10,000 BC 10,000 – 3,500 BC 3,500 – 2,200 BC 2,200 – 700 BC 700 BC – AD 43
Romano-British	AD 43 – AD 410
Early Medieval	AD 410 – AD 1066
Late Medieval	AD 1066 – AD 1540
Post-medieval	AD 1540 – c1750
Industrial Period	cAD1750 – 1901
Modern	Post-1901

14.7.2 Prehistoric Period (30,000 BC – AD 43): Evidence for Palaeolithic activity in Suffolk is well-attested with sites, such as Hoxne, Barnham and High Lodge, which have indicated that human occupation in East Anglia began around 500,000 years ago (Austin 1997: 7). Indeed, the site at Hoxne is located approximately 2km east of the Project Site. Mesolithic activity is known from surface finds within East Anglia, particularly within the Fens and the Brecklands (Austin 1997: 9), although no evidence has been found within the Project Site or its 1 km Study Area.

14.7.3 The advent of the Neolithic brought many changes to the landscape including deforestation as demonstrated at Diss Mere just to the north of the 1 km Study Area (Brown and Murphy 1997: 12). This led to a change in flint tool technology and four Neolithic flint finds have been found within the 1 km Study Area (**HA02**, **HA18**, **HA37** and **HA46**). Despite the introduction of bronze during the Bronze Age, flint continued in use. Two findspots of Bronze Age axes have been revealed within the 1 km Study Area (**HA10** and **HA11**) indicating

human activity. Indeed, they may have been used for woodland management as indicated by pollen analyses at Scole (Brown and Murphy 1997:16), just to the north of the 1km Study Area. Late Neolithic and early Bronze Age activity has been identified during an excavation at Hartismere High School Playing Fields in Eye. The evidence comprised four cremations and a crouched inhumation of probable Bronze Age date (Caruth and Goffin 2012).

14.7.4 Iron Age activity within the 1 km Study Area has been identified during an excavation at Hartismere High School Playing Fields revealing evidence of late Bronze Age/early Iron Age pottery, pits and two roundhouses suggesting occupation (Caruth and Goffin 2012). Further late Bronze Age/early Iron Age pottery was found during an evaluation at the Sports Hall Car Park at Hartismere High School in Eye (Craven 2008a). An evaluation at Hartismere Hospital in Eye supports this with further finds of pottery (Brooks 2012). Late Iron Age field systems have been indicated at Scole and Yaxley and an enclosure found at Barnham (Bryant 1997: 28). An Iron Age pottery scatter has been discovered within the Project Site (**HA38**).

14.7.5 Romano-British Period (AD 43 – AD 410): The remains of a Roman Road (Margary's 3d) run through the centre of the Project Site in a north-west/south-east direction (**HA40**). It is now overlain by the modern A140. This road connects Coddenham to the south of the Project Site with Scole, a Roman settlement site, to the north. The road was sectioned at Coddenham to reveal an agger 1 ft 6 inches high, which could be dated to *c* AD 70 (Moore with Plouviez and West 1988: 29). Excavations at Hartismere High School in Eye have revealed a multi-period settlement with the majority of the activity dating to the Romano-British period. The finds included Romano-British pottery, metalwork including coins, and ceramic building material suggesting there was a structure (Craven 2009). Romano-British pottery was also found during an evaluation at Hartismere Hospital in Eye (Brooks 2012). Findspots of Romano-British pottery and artefacts have also been yielded within the Project Site and 1km Study Area (**HA07**, **HA08**, **HA12**, **HA14**, **HA17**, **HA22**, **HA29** and **HA41**).

14.7.6 Early Medieval Period (AD 410 – AD 1066): The name Eye derives from the Old English meaning 'island' due to the marshy conditions surrounding the settlement and its close proximity of the River Dove (Paine 1993: 1). Anglo-Saxon (AD 410-1066) evidence is plentiful within Suffolk with the famous burial site of Suffolk Hoo located approximately 35km south-east of the Project Site. Within the 1 km Study Area, evidence for Anglo-Saxon occupation is clear from the excavations at Hartismere High School Playing Fields in Eye (Caruth and Goffin 2012). The settlement comprised two earth-fast post-hole buildings and at least 18 sunken-featured buildings. A trackway

bisected the site in a north-south direction. Test pits at the New Sports Hall, Hartismere High School in Eye identified early Anglo-Saxon features, which appear to be a continuation of the settlement activity witnessed at the Playing Fields (Craven 2008b). An evaluation at Hartismere Hospital in Eye has also revealed early Anglo-Saxon pottery and a brooch, along with occupational evidence (Brooks 2012). Further evidence of Anglo-Saxon activity is demonstrated by the numerous findspots within the 1 km Study Area (**HA15**, **HA35**, **HA36** and **HA42**).

14.7.7 Late Medieval Period (AD 1066 – 1540): The Domesday Book mentions Eye, along with the nearby settlements of Thrandeston, Yaxley and Brome suggesting they were established settlements by 1086. They formed part of the Hundred of Hartismere, an administrative division (Rumble 1986). This indicates the early antiquity of these sites and it is likely that they were established during the Anglo-Saxon period. Eye Castle was built in 1066-71 by William Malet, a Norman Baron, who came to England with William the Conqueror (Paine 1993, 1). His son, Robert, founded the Benedictine Priory of Eye in 1086-7 (Page 1975: 72). Indeed, several medieval churches are known in the surrounding area, such as St Margaret in Thrandeston (**HA06**), St Mary at Thornham Parva, St Mary in Yaxley (**HA16**), Church of St Peter and St Paul and the Church of St Peter at Palgrave, all of which are Grade I Listed Buildings.

14.7.8 From the early fifteenth century, the Cornwallis family became residents at Brome and owned lands in the surrounding area (Paine 1993: 23), including the land on which the Project Site stands. This is attested by the Eye Enclosure Map of 1812, which states that the Marquis Cornwallis is the landowner. The land was used for agricultural purposes.

14.7.9 Four medieval greens have been identified within the 1 km Study Area (**HA01**, **HA04**, **HA19** and **HA32**) and provide insights into medieval settlement patterns, particularly on the claylands (Wade 1997: 52). At Langton Grove Farm, an evaluation revealed sixteenth century activity including ditches and pits close to a green-edge settlement. One of the deep features has been interpreted as an infilled pond (Everett 2003). At land north of Langton Lodge, an evaluation also revealed evidence of the original medieval green edge (Gardner 2004). Archaeological monitoring at Mellis Primary School located a medieval ditch, which has been interpreted as a marker for separate plots on Mellis Green (**HA01**) (Craven 2008c). An evaluation at the southern edge of Mellis green revealed evidence of early medieval pottery, two pits and a ditch. The evidence suggests the area was used for fish ponds and not settlement (Sommers 1998). Indeed, the green at Mellis is of regional significance as it contains a church (St Mary the Virgin, a Grade II* Listed Building,

See Table 6, below), which is an unusual settlement pattern for this area. Medieval settlement patterns normally comprised a 'hall-and-church', which included a manorial hall, normally moated with an associated church. These 'hall-and-church' settlements sometimes developed into villages and hamlets, which can be seen today. These settlements tend to be earlier in date than the green-edge settlements (Suffolk HLC).

14.7.10 Numerous moated sites have been found within Suffolk, six of which are located within the 1 km Study Area (**HA05**, **HA13**, **HA20**, **HA27**, **HA28** and **HA47**). They generally comprise wide ditches, often water-filled, that enclose one or more islands of dry ground on which stood domestic or religious buildings. They functioned as status symbols rather than for defensive purposes and were generally built between 1250 and 1350.

14.7.11 **Post-Medieval Period (AD 1540 – c AD 1750)**: Agricultural activity continued into the post-medieval period as indicated by the historical mapping (See Section 4.3, below). The majority of the buildings were farmhouses, such as Goswold Hall (**HA20**), which was constructed during the late sixteenth / early seventeenth century. It was also a moated manorial site and probably has medieval origins. Its dovecote (**HA21**) was constructed sometime during the eighteenth century.

14.7.12 Other evidence of post-medieval activity within the 1 km Study Area includes quarrying activity, which was revealed during an evaluation at Hartismere Hospital in Eye (Brooks 2012). A post-medieval ditch was found during an evaluation at Yaxley, along with unstratified post-medieval ceramic building materials and pottery (Brooks 2008).

14.7.13 **Industrial Period (c AD 1750 – 1901)**: In 1823, the last Marquis Cornwallis passed away and his lands were bought by Matthias Kerrison of Bungay for his son, General Sir Edward Kerrison (Paine 1993: 23). During this period farming was the mainstay of the economy in this part of Suffolk and barley, in particular, was grown for its use in brewing and malting. A Grade II Listed Building, Malting Farm (**HA27**), is located within the study area, which may have functioned as such. Other buildings of note include Hartismere Hospital (**HA45**), a former union workhouse which became a 'Poor Law Institution' in the 1920s as indicated on Ordnance Survey (OS) mapping (1927). A post-mill (**HA43**) and a windmill (**HA33**) are the only assets within the 1 km Study Area to suggest industrial activities, albeit on a small-scale.

14.7.14 **Modern Period (Post-1901)**: During World War II, an airfield was constructed at Eye (**HA31**) by the US Army Engineer Battalions 827 and 859 and British contractors. Work began in 1943 and was completed in early 1944 and comprised three intersecting runways, two

hangars, administrative buildings and living quarters for 2,894 servicemen. Station 134 of the 490th Bomb Group of the US Air Force occupied the base until 1945 when it was handed over to the RAF Bomber Command. It was decommissioned in 1961 and part of it was subsequently developed for industrial and residential use. Stromit Boards were first to occupy the site in 1962, followed by A. Moor and Sons in 1966 and Mill Farm Mushrooms in 1970. British Gas erected a Gas Compressor station in 1975 on the airfield. In 1992, the Eye Chicken Litter fired power station was opened (Paine 1993: 59-60). Archaeological monitoring in Yaxley revealed a WWII spigot mortar emplacement, which formed part of the outer defences of Eye Airfield (Sommers 2011).

14.8 Archaeological Interventions

14.8.1 A number of archaeological interventions have been carried out within the study area. Some of these have already been referred to in the archaeological and historical background (e.g. Caruth and Goffin 2012, Craven 2008a, Craven 2008b, Craven 2008c, Craven 2009, Brooks 2008, Brooks 2012, Sommers 2011).

14.8.2 An archaeological evaluation was carried out in advance of the construction of an industrial unit at the Roy Humphrey site to the immediate west of the proposed Power Generation Plant. However, this did not reveal any features, finds or deposits of archaeological significance (Cass 2010). A further evaluation was undertaken again to the immediate west of the Project Site in advance of the construction of two wind turbines. This did not reveal any features, finds or deposits of archaeological significance (Cass 2011).

14.9 Development of the Scheme Area

14.9.1 A number of maps have been consulted including county, tithe and Ordnance Survey. One of the earliest county maps to show Eye and its environs is Speed's map of Suffolk (1610), which annotates the main settlements discussed in this desk-based assessment including Ays (Eye), Thrandeston, Yaxley and Brome highlighting the antiquity of these places. All of these settlements appear to be associated with a castle or manor house indicating their importance at this time (Insert 14.1).

Insert 14.1 - Extract from Speed's Map of Suffolk, 1610 (not to scale)

14.9.2 Hodskinson's map of Suffolk (1787) again lists all the relevant settlements, although with some changes in spellings. Brome is 'Broome', Thrandeston is 'Thrandiston' and Goswold Hall (HA20) is annotated as 'Gosland Hall'. Broome Green (HA32), Great Green (HA19), Little Green (HA04) and Mellis Green (HA01) are clearly shown, amongst others, highlighting the medieval agricultural landscape. Malting Farm (HA27) can be seen as a building to the north of 'Gosland Hall' and to the south of the road. Eye Priory is also annotated. The Roman Road (HA40) can clearly be seen running through the Project Site (Insert 14.2).

Insert 14.2 - Extract from Hodskinson's Map of Suffolk, 1787 (not to scale)

14.9.3 The study area extends over several historic parishes and therefore a number of tithe maps were consulted including Yaxley (1839), Eye (1839) and Thrandeston (1846) (Insert 14.3 & Insert 14.4). The tithe map for Yaxley (1839) includes the southern half of both the western and eastern parts of the Project Site. It does not, however, include the proposed Power Generation Plant site or the proposed Gas and Electric Connections. According to the tithe apportionment, the land in the south-eastern part of the Project Site belonged to Sir Edward Kerrison and the occupier was Samuel Peck. The land was used for predominantly arable purposes, along with some pasture. The plots within the south-western part of the Project Site were also used predominantly for arable agricultural purposes and were owned by J.C. Cobbold Esq. and were occupied by a James Allen. The Roman Road (**HA40**) can clearly be seen as a major thoroughfare through the Project Site (Insert 14.3).

Insert 14.3 - Extract from the Yaxley Tithe Map, 1839 (not to scale)

14.9.4 Eye Tithe map (1839; Insert 14.4) shows the north-eastern part of the study area, which roughly covers plots 401 and 402. These were owned by Sir Edward Kerrison and occupied by Robert Tillett. They were both known as 'Long Field' and were used for arable purposes. These fields and their associated boundaries (HA30) are likely to be medieval in origin as indicated by the long strips. All of the surrounding land within the study area was owned by Sir Edward Kerrison and much of it occupied by Robert Tillett for arable purposes. The field name for plot 399 was 'Brick hearth close', which suggests that a brick kiln may have been located here to the immediate west of the study area. The Roman Road (HA40) can be seen running in a north-east/south-west direction along the western limits of the map.

Insert 14.4 - Extract from the Eye Tithe Map, 1839 (not to scale)

14.9.5 An extract from the Thrandeston tithe map (1846) is shown in Insert 14.5, below. This tithe map shows the north-western part of the study area and, again, demonstrates the agricultural landscape of nineteenth century mid Suffolk. Goswold Hall (**HA20**) and its associated dovecote (**HA21**) are shown on this map, although they are not annotated as such. Goswold Hall is listed as 'premises', although to the south is a field known as 'Dovehouse close'. The landowner is Thomas French Esq. and the occupier is John Kirby. The land surrounding Goswold Hall is owned and occupied by the same people and a mixture of arable and pasture land use is apparent.

14.9.6 The Roman Road (**HA40**) can be seen running through the map in a north-east/south-west direction. Other farmhouses are listed, such as 'Maltings Farm' (**HA27**) to the north, which is a Grade II Listed Building and also a medieval moated site. 'The Lays', later known as The Leys on Ordnance Survey mapping, is located to the south-west of Goswold Hall.

Insert 14.5 - Extract from the Thrandeston Tithe Map, 1846 (not to scale)

14.9.7 The Ordnance Survey mapping shows more detailed and accurate information regarding the development of the land from the 19th century onwards. The earliest 25 inch mapping dates to 1886 and is shown in Insert 14.6, below. The vast majority of the study area can be seen in this map, apart from the north-western and eastern tips. The study area is located at the eastern edge of the map to the immediate east of Yaxley Plantation. This area appears to be the same as the earlier tithe map with agricultural use. The Roman Road (**HA40**), Goswold Hall (**HA20**) and medieval field boundaries (**HA30**) can clearly be seen on this map also.

Insert 14.6 - Extract from the 25 inch to 1 mile OS map, 1886

14.9.8 The next OS map (1904) covers the same area and shows no changes to the fields. The Roman Road (**HA40**) and Goswold Hall (**HA20**) are annotated and the medieval field boundaries (**HA30**) are still extant (Insert 14.7).

Insert 14.7 - Extract from the 25 inch to 1 mile OS map, 1904

14.9.9 The final OS map dated to 1927 (Insert 14.8) does not show any alterations from the previous map (Insert 14.7).

Insert 14.8 - Extract from the 25 inch to 1 mile OS map, 1927

14.9.10 An aerial photograph from 1947 was viewed, which shows Eye Airfield (HA31) (Rolfe 2009) and the field boundaries (HA30). Further Ordnance Survey mapping (1958, 1977, 1989) show the airfield (HA31), which was in disuse by this point. The field boundaries (HA30) are still extant on the 1958 mapping, but are not shown on the later maps. However, the land has continued to be used for agricultural purposes and it is possible that they are still extant.

14.10 Site Visit and Setting Initial Assessment

14.10.1 A site visit was carried out in June 2013, which included a drive through of the 1 km Study Area. A photographic archive was compiled and a selection of views is presented as Insert 14.9 to Insert 14.16. The land within the study area comprises part of the former Airfield (**HA31**) in the eastern part, whilst the western part is dominated by agricultural land. Within the 1km Study Area are several small villages, such as Yaxley, Thrandeston, Brome, Langton Green and parts of Eye and Mellis. Between these villages is gently undulating agricultural land, belts of trees and industrial parks. A photographic record was maintained throughout and a selection of photographs is presented in Insert 14.9 to Insert 14.16, below.

14.10.2 In terms of setting, there is a belt of trees to the east of Goswold Hall (**HA20**) and its dovecote (**HA21**), which would screen the setting and

the view to a certain extent. A further belt of trees lies to the east of the study area, which would aid the screening of settings of Heritage Assets in that direction. There are also trees to the north-east of Yaxley, which contains a number of Listed Buildings. However, the trees would not completely screen the settings, especially during the winter months. Further assessment of the visual impact on settings of Heritage Assets will be discussed in more detail in the forthcoming Cultural Heritage Chapter of the Environmental Statement.

Insert 14.9 - General view of Goswold Hall (HA20) showing the agricultural landscape and a wind turbine, facing south-east

Insert 14.10 - General view of the A140, a former Roman Road (HA40), facing south-west

Insert 14.11 - View of the remains of part of the north-south main runway (HA31) with Broome Common in the background (HA32), facing north

Insert 14.12 - General view of arable fields in the western part of the study area showing overhead lines, facing west

Insert 14.13 - General view of the north-eastern part of the study area, facing south-west

Insert 14.14 - General view of the south-eastern part of the study area showing belt of trees and two turbines, facing north

Insert 14.15 - View from Eye Airfield Industrial Park showing the remains of the north-west/south-east runway (HA31), facing north-west

Insert 14.16 - General view from Mid Suffolk Industrial Park looking towards the study area, facing south

14.11 Gazetteer of Heritage Assets

14.11.1 A total of 47 Heritage Assets have been recorded during this desk-based assessment and their full details are provided here. This is followed by a table of listed buildings (Table 14.7) and portable antiquities found within the study area (Table 14.8).

Heritage Asset Number	***01***
Asset Name	Mellis Green
NGR	TM 1050 7458
Asset Type	Village Green
Period	Medieval
Statutory Designation	None
HER No	MLS 011
Value/Importance	Regional
Description	A large green is still extant at Mellis covering 88 ha. It is shown on Hodskinson's map (1787).

Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**02**
Asset Name	Flint Axe
Grid Ref	TM 1057 7576
Asset Type	Findspot
Period	Neolithic
Statutory Designation	None
HER No	TDE 005
Value/Importance	Local
Description	Polished flint axe found in a railway line ditch, probably from field ditch dredging.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**03**
Asset Name	Green Lane
NGR	TM 1113 7614
Asset Types	Findspot
Period	Medieval
Statutory Designation	None
HER No	TDE 003
Value/Importance	Local
Description	Early medieval pottery found on sand and clay surface 3-4 m below ground on Green Lane, near the Post Office.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**04**
Asset Name	Little Green
NGR	TM 1132 7667
Asset Types	Site of Green
Period	Medieval

Statutory Designation	None
HER No	TDE 013
Value/Importance	Local
Description	Site of a green mapped by Hodskinson (1787).
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**05**
Asset Name	Church Farm
NGR	TM 1155 7634
Asset Types	Possible moat
Period	Medieval
Statutory Designation	Grade II Listed Building
HER No	TDE 011
Value/Importance	National
Description	A U-shaped pond at Church Farm is possibly the remains of a moat. The interior was unoccupied, however. A long straight pond lies adjacent to the putative moat. The farmhouse on the same site dates to the 17th century and is timber-framed. The moat lies to the south of the farmhouse.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**06**
Asset Name	Church of St Margaret
NGR	TM 1166 7647
Asset Types	Church
Period	Medieval
Statutory Designation	Grade I Listed Building
HER No	TDE 009
Value/Importance	National
Description	The church is mentioned at Thrandeston in the Domesday Book. It is the Parish church, which dates to the 15th century, but with a 13th century chancel. It was restored *c* 1870-80.

Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**07**
Asset Name	Findspot
NGR	TM 1163 7549
Asset Type	Findspot
Period	Romano-British
Statutory Designation	None
HER No	TDE 004
Value/Importance	Local
Description	First to third century pottery, including samian and colour-coated ware, found along with flue tiles, two coins and a sandstone quern. The material has been collected over a large area by the landowner since the 1970s.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**08**
Asset Name	Finds Scatter
NGR	TM 1173 7550
Asset Types	Findspot
Period	Romano-British
Statutory Designation	None
HER No	TDE 017
Value/Importance	Local
Description	Mainly Romano-British surface and metal detected scatter of pottery and metalwork.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**09**
Asset Name	Findspot
NGR	TM 1159 7479
Asset Types	Findspot
Period	Medieval

Statutory Designation	None
HER No	YAX 004
Value/Importance	Local
Description	A lead token or seal was found.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**10**
Asset Name	Axes
NGR	TM 1172 7421
Asset Types	Findspots
Period	Bronze Age
Statutory Designation	None
HER No	YAX 013
Value/Importance	Local
Description	Two metal detected fragments of socketed axes were found.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**11**
Asset Name	Mellis Road
NGR	TM 1188 7437
Asset Types	Findspot
Period	Bronze Age
Statutory Designation	None
HER No	YAX 012
Value/Importance	Local
Description	Metal detected fragment of large socketed axe, possibly of Sompting type, was found.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**12**
Asset Name	Pottery

NGR	TM 1203 7499
Asset Types	Findspot
Period	Romano-British
Statutory Designation	None
HER No	YAX 006
Value/Importance	Local
Description	Samian and grey ware shards were found.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**13**
Asset Name	Moat
NGR	TM 1205 7435
Asset Types	Moat
Period	Medieval
Statutory Designation	None
HER No	YAX 001
Value/Importance	Local
Description	Sub-rectangular moat, unoccupied and located at the road junction in the village. Pottery dating to the 13th and 14th centuries was found in 1968.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**14**
Asset Name	Coin
NGR	TM 1213 7422
Asset Types	Findspot
Period	Romano-British
Statutory Designation	None
HER No	YAX 005
Value/Importance	Local
Description	Bronze sestertius dating to probably Faustina Jnr (died AD

	175) found in garage garden. It is very worn.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**15**
Asset Name	Brooch
NGR	TM 1222 7401
Asset Types	Findspot
Period	Anglo-Saxon
Statutory Designation	None
HER No	YAX 002
Value/Importance	Local
Description	Metal detector finds of cylindrical lead weight with a piece of decorated gilded bronze, (probably from a saucer brooch) set in the top and 'caterpillar' type brooch found in 1998.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**16**
Asset Name	Church of St Mary
NGR	TM 1215 7395
Asset Types	Church
Period	Medieval
Statutory Designation	Grade I Listed Building
HER No	YAX 010
Value/Importance	National
Description	The Church of St Mary dates to the 14th century, but was largely rebuilt in the 15th century. In 1868, the church was restored with chancel rebuilt and south porch added by E.L. Blackburne. It is constructed of flint rubble.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**17**
Asset Name	Dukes Bridge
NGR	TM 1222 7401

Asset Types	Findspot
Period	Romano-British
Statutory Designation	None
HER No	YAX 002
Value/Importance	Local
Description	A Roman coin was found. Saxon finds were also discovered here in 1998.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**18**
Asset Name	Flint
NGR	TM 1223 7520
Asset Types	Findspot
Period	Neolithic
Statutory Designation	None
HER No	YAX 007
Value/Importance	Local
Description	A partly polished flint axe was found.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**19**
Asset Name	Great Green
NGR	TM 1224 7722
Asset Types	Site of a Green
Period	Medieval
Statutory Designation	None
HER No	TDE 012
Value/Importance	Local
Description	Site of a green mapped by Hodskinson (1787).
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset	**20**

Number	
Asset Name	Goswold Hall
NGR	TM 12414 75617
Asset Types	Hall and moat
Period	Medieval
Statutory Designation	Grade II Listed Building
HER No	TDE 002
Value/Importance	National
Description	A late 16th century farmhouse that has been later re-built. It is a moated manorial site, which was probably originally square, part lost now. It is located close to the parish boundary between Yaxley and Thrandeston.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**21**
Asset Name	Dovecote associated with Goswold Hall
NGR	TM 12518 75563
Asset Types	Dovecote
Period	Post-medieval
Statutory Designation	Listed Building Grade II
HER No	DSF5258
Value/Importance	National
Description	A dovecote associated with Goswold Hall dates to the early 18th century.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**22**
Asset Name	Brooch
NGR	TM 1251 7720
Asset Type	Findspot
Period	Romano-British
Statutory Designation	None

HER No	TDE 006
Value/Importance	Local
Description	A fragment of a bronze crossbow brooch was found.
Assessment	The heritage asset lies within 1 km of .
Heritage Asset Number	**23**
Asset Name	Metalwork
NGR	TM 1251 7722
Asset Types	Findspot
Period	Medieval
Statutory Designation	None
HER No	TDE 006
Value/Importance	Local
Description	Scatter of metalwork was found including two coins dating to Henry III and Edward I/II, a gilded finger ring, and a bronze fitting with animal head terminal.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**24**
Asset Name	Pottery Scatter
NGR	TM 1248 7508
Asset Types	Findspot
Period	Medieval
Statutory Designation	None
HER No	YAX 003
Value/Importance	Local
Description	A scatter of 13th to 14th century shards was found.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**25**
Asset Name	Enclosure
NGR	TM 1240 7334

Asset Types	Enclosure
Period	Post-medieval
Statutory Designation	None
HER No	YAX 008
Value/Importance	Local
Description	Sub-rectangular wood belted enclosure, circa 220 m x 210 m located to the immediate south of Yaxley Hall. It is a dry site, apart from a pond that extends to the interior from the east arm.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**26**
Asset Name	Beacon Hill
NGR	TM 1248 7364
Asset Types	Mound
Period	Unknown
Statutory Designation	None
HER No	YAX 009
Value/Importance	Local
Description	'Beacon Hill' is annotated and shown on OS maps.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**27**
Asset Name	Malting Farm
NGR	TM 1285 7631
Asset Types	Moated Site
Period	Medieval
Statutory Designation	Grade II Listed Building
HER No	TDE 001
Value/Importance	National
Description	Moated complex located near the parish boundary between Thrandeston and Brome. It was probably originally sub-

	rectangular, but now partly gone. It comprised enclosures and ponds. It is shown on Hodskinson's map (1787) and abuts the south side of the former green.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**28**
Asset Name	Home Farm
NGR	TM 1289 7637
Asset Types	Probable moat
Period	Medieval
Statutory Designation	Grade II Listed Building
HER No	TDE 014
Value/Importance	National
Description	Probable former moat north of Brome Common and Malting Farm. Only the north and east arms of the moat survive and the northern arm appears to abutting the former green. The house associated with the farm is a Listed Building dating to the 16th century, rebuilt in the 17th century and altered in the 19th century.
Assessment	The heritage asset lies within 1km of the study area
Heritage Asset Number	**29**
Asset Name	Pottery Scatter
NGR	TM 1288 7597
Asset Types	Findspot
Period	Romano-British
Statutory Designation	None
HER No	TDE 007
Value/Importance	Local
Description	A scatter of Romano-British grey wares was found.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**30**
Asset Name	Field Boundaries

NGR	TM 1325 7500
Asset Type	Field Boundaries
Period	Medieval/Post-medieval
Statutory Designation	None
HER No	None
Value/Importance	Local
Description	Field boundaries have been noted on the OS (1886) and Eye tithe mapping (1839) and the fields appear to be medieval strip fields. The fields were once owned by Sir Edward Kerrison and were called 'Long Field' on the tithe map. The fields lie within the proposed Power Generation Plant.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**31**
Asset Name	Brome/Eye Airfield
NGR	TM 1339 7513
Asset Type	Airfield
Period	Modern
Statutory Designation	None
HER No	EYE 072
Value/Importance	Local
Description	WWII airfield, originally part of the Cornwallis estate. It was built by the US Army Engineer Battalions 827 and 859 and British contractors. Work began in 1943 and was completed in early 1944. Station 134 of the 490th Bomb Group of the US Air Force occupied the base until 1945 when it was handed over to the RAF Bomber Command. It was decommissioned in 1961. A scatter of Roman and Medieval finds has been found here.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**32**
Asset Name	Broome Common
NGR	TM 1335 7596

Asset Types	Site of a Green
Period	Medieval
Statutory Designation	None
HER No	TDE 016
Value/Importance	Local
Description	Former green site shown on Hodskinson's map (1787) and the Eye enclosure map (1812). Traces of green-edge settlement survive in places.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**33**
Asset Name	Windmill
NGR	TM 1355 7615
Asset Type	Windmill
Period	Post-medieval
Statutory Designation	None
HER No	BRM 005
Value/Importance	Local
Description	Windmill with two storey roundhouse, which was demolished circa 1900. It had four patent sails, a fantail and two pairs of stones in the head.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**34**
Asset Name	Rapsy Tapsy Lane
NGR	TM 1335 7375
Asset Types	Path
Period	Unknown
Statutory Designation	None
HER No	EYE 054
Value/Importance	Local
Description	This lane is a sinuous hollow way defining the parish

	boundary between Eye and Yaxley. It joins Castleton Way to the north and Yaxley road to the south and is partly shown on Hodskinson's map (1787). It may have followed the parish line further and may once have extended into The proposed Project red line boundary and into the proposed Power Generation Plant.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**35**
Asset Name	Brooch
NGR	TM 1344 7395
Asset Type	Findspot
Period	Anglo-Saxon
Statutory Designation	None
HER No	EYE 051
Value/Importance	Local
Description	Detector find of a small long-type brooch found in 1996. It has a trefoil head around a central square with incised line decoration. It dates to the early Saxon period.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**36**
Asset Name	Brooch
NGR	TM 1356 7416
Asset Type	Findspot
Period	Anglo-Saxon
Statutory Designation	None
HER No	EYE 108
Value/Importance	Local
Description	Metal detector find of a cruciform brooch fragment.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**37**
Asset Name	Flint

NGR	TM 1362 7412
Asset Type	Findspot
Period	Neolithic
Statutory Designation	None
HER No	EYE 005
Value/Importance	Local
Description	Flint scraper and a few rough flakes found in disturbed soil at the end of the playing field at Eye County 'Modern School'.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**38**
Asset Name	Pottery Scatter
NGR	TM 1355 7655
Asset Type	Findspot
Period	Iron Age
Statutory Designation	None
HER No	BRM 004
Value/Importance	Local
Description	Early Iron Age pottery scatter comprising one cordoned and one with finger nail ornament.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**39**
Asset Name	Devil's Hand basin
NGR	TM 1359 7682
Asset Types	Site of a cross
Period	Medieval
Statutory Designation	None
HER No	BRM 003
Value/Importance	Local

Description	Site of a cross at a road junction near The Devil's Hand basin. It may have also been the site of a tollgate where the keeper made travellers put their coins into a bowl of vinegar.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**40**
Asset Name	Roman Road
NGR	TM 13639 76923
Asset Type	Roman Road
Period	Romano-British
Statutory Designation	None
HER No	BRM011
Value/Importance	Local
Description	Length of Margary's 3d Roman Road running between Scole to the north and Yaxley to the south. It was known as Pye Road in the Medieval period. It is also the line of the modern A140.
Assessment	The heritage asset lies within the study area
Heritage Asset Number	**41**
Asset Name	Pottery
NGR	TM 1363 7707
Asset Type	Findspot
Period	Romano-British
Statutory Designation	None
HER No	BRM Misc
Value/Importance	Local
Description	Black pottery, believed to be Roman, found in a ditch near The Swan, circa 1935. Now lost.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**42**
Asset Name	Brooch

NGR	TM 1375 7424
Asset Types	Findspot
Period	Anglo-Saxon
Statutory Designation	None
HER No	EYE 053
Value/Importance	Local
Description	Metal detector find of a cruciform type of brooch foot fragment found in 1996. It is possibly unfinished and dates to the early Saxon period.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**43**
Asset Name	Victoria Mill
NGR	TM 1392 7426
Asset Type	Mill
Period	Post-medieval
Statutory Designation	Grade II Listed Building
HER No	EYE 032
Value/Importance	National
Description	The post-mill was built in 1779 and used until the 1930s and collapsed in 1955. Parts of it were used in the restoration of other post mills. The remains include roundhouse walls and four piers. It is in an advanced state of decay.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**44**
Asset Name	Hospital of St Mary Magdalen
NGR	TM 1395 7375
Asset Type	Hospital
Period	Medieval
Statutory Designation	None
HER No	EYE 046

Value/Importance	Local
Description	Place-name evidence for the hospital. The 1839 tithe map lists two fields as Magdalen Field, now part of the cemetery.
Impact of Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**45**
Asset Name	Hartismere Hospital
NGR	TM 1407 7405
Asset Types	Hospital
Period	Modern
Statutory Designation	None
HER No	EYE 062
Value/Importance	Local
Description	This was formerly Hartismere Union Workhouse and later became a Poor Law Institution, which was mapped by the OS in the 1920s. It later became Hartismere Hospital with the apparent survival of the original buildings.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**46**
Asset Name	Arrowhead
NGR	TM 1415 7435
Asset Type	Findspot
Period	Neolithic
Statutory Designation	None
HER No	EYE 026
Value/Importance	Local
Description	A petit tranchet derivative arrowhead was found.
Assessment	The heritage asset lies within 1 km of the study area
Heritage Asset Number	**47**
Asset Name	Parkes Farm

NGR	TM 1417 7657
Asset Type	Possible moat
Period	Medieval
Statutory Designation	None
HER No	BRM 009
Value/Importance	Local
Description	Surviving wet fragments of a sub-rectangular moat.
Assessment	The heritage asset lies within 1 km of the study area

Table 14.7 - Listed Buildings within the 1 km Study Area

Settlement	**Listings**
Thrandeston (500 m from Project Red Line Boundary)	1 Grade I (St Margaret's Church) 1 Grade II* (The Manor House) 21 Grade II (DSF4175; DSF4179; DSF4166; DSF5525; DSF5527; DSF4726; DSF4926; DSF4927; DSF5394; DSF5396; DSF5524; DSF5813; DSF6230; DSF6460; DSF6655; DSF6775; DSF6962; DSF5812; DSF5258; DSF6044; DSF6963)
Yaxley (200 m from The proposed Project Red Line Boundary)	1 Grade I (Church of St Mary) 3 Grade II* (Yaxley Hall, Yaxley Manor House, Guildhall Cottage) 13 Grade II (DSF3944; DSF4109; DSF4110; DSF5441; DSF5442; DSF5041; DSF5648; DSF6268; DSF6274; DSF6521; DSF6750; DSF6896; DSF6942)
Eye (part of it is within The proposed Project Red Line Boundary)	13 Grade II (DSF4584; DSF4592; DSF4624; DSF5220; DSF6094; DSF6095; DSF6506; DSF6507; DSF6508; DSF6509; DSF6928; DSF7004; DSF17196)
Mellis (1 km from The proposed Project Red Line Boundary)	1 Grade II* (Elm Tree Farmhouse) 7 Grade II (DSF3825; DSF4115; DSF4717; DSF5817; DSF6476; DSF6664; DSF6960)

Brome and Oakley (Within The proposed Project Red Line Boundary)	1 Grade II* (Park Farmhouse) 8 Grade II (DSF4905; DSF5355; DSF5364; DSF5781; DSF5788; DSF6063; DSF6546; DSF6976)

Table 14.8 - Portable Antiquities within the 1 km Study Area

Settlement	Listings	Description
Eye	18 finds: MSF17366, MSF27102, MSF27098, MSF27105, MSF27106, MSF27137, MSF27103, MSF27111, MSF27133, MSF27114, MSF27115, MSF27132, MSF27100, MSF27112, MSF27096, MSF27117, MSF27118, MSF27119	Saxon metalwork, Medieval artefact scatter, Medieval metalwork, artefact scatter, Saxon metalwork, Post-medieval metalwork, Medieval metalwork, Post-medieval metalwork, Saxon brooch, Medieval metalwork, Middle Saxon coins, metal detector finds from excavation, Saxon brooch, Medieval artefact scatter, Medieval coin, Post-medieval coin, Medieval cloth seal, Medieval buckle
Hoxne	1 find: MSF27002	Roman bow brooch
Yaxley	24 finds: MSF27028, MSF27029, MSF27025, MSF27030, MSF27027, MSF27026, MSF27036, MSF27038, MSF27050, MSF27037, MSF27042, MSF27031, MSF27032, MSF27035, MSF27039, MSF27040, MSF27041, MSF27043, MSF27045, MSF27046, MSF27047, MSF27048, MSF27049, MSF27051	Roman pottery and metalwork, pottery and artefact scatter, Saxon metalwork, Saxon metalwork, Medieval metalwork, Roman metalwork, Saxon/Viking silver ingot, Saxon bridle fitting, multiperiod artefact scatter, metalwork, Roman metalwork, Post-medieval coin, Medieval key, Roman bell, undated metalworking debris, Medieval purse, Neolithic/Bronze Age flint, Medieval stirrup, Saxon coin, Medieval coin, Post-medieval artefact, Medieval harness pendant, Medieval purse, Medieval buckle

14.12 Significance of the Heritage Assets

14.12.1 This section presents the archaeological, historic, architectural and aesthetic significance of the Heritage Assets as appropriate. The assessment has identified a total of 47 Heritage Assets within the study area and its 1 km Study Area. Of these, 11 Heritage Assets have been

recorded within the study area (**HA09**, **HA12**, **HA18**, **HA20**, **HA21**, **HA24**, **HA27**, **HA29**, **HA30**, **HA31** and **HA40**), three of which are Grade II Listed Buildings (**HA20**, **HA21** and **HA27**). An additional five designated Heritage Assets lie within the 1 km Study Area (**HA05**, **HA06**, **HA16**, **HA28** and **HA43**), of which two are Grade I Listed Buildings (**HA06**, **HA16**) and three are Grade II Listed Buildings (**HA05**, **HA28**, **HA43**). A further Heritage Asset (**HA34**) is a lane that lies within the 1 km Study Area and may once have extended onto the study area. Table 14.9, below, highlights the cultural value of the Heritage Assets.

Table 14.9 - Value of the Heritage Assets Identified

Value/sensitivity	Heritage Assets	Mitigation
International	N/A	To be avoided
National	**HA05**, **HA06**, **HA16**, **HA20**, **HA21**, **HA27**, **HA28**, **HA43**	To be avoided
Regional/County	**HA01**	Avoidance recommended
Local/Borough	**HA02**-**HA04**, **HA07**-**HA15**, **HA17**-**HA19**, **HA22**-**HA25**, **HA29**-**HA33**, **HA35**-**HA42**, **HA44**-**HA47**	Avoidance recommended
Neighbourhood	N/A	Avoidance not envisaged
Uncertain	**HA26**, **HA34**	Avoidance unnecessary

Criteria

14.12.2 Where assets do not possess a statutory designation, their significance has been determined with reference to the SoS's criteria for assessing the national importance of monuments, as contained in Annex 1 of the policy statement on scheduled monuments (DCMS, 2010). These criteria relate to period, rarity, documentation, group value, survival/condition, fragility/vulnerability, diversity, and potential. The definition of these criteria is presented in Table 14.10, below.

Table 14.10 - Definition of Criteria used to Determine Archaeological Significance

Criteria	Definition
Rarity	This should take account of all aspects of the distribution of a particular class of Heritage Asset, both in a national and a regional context.
Period	Heritage Assets that characterise a category of asset or period.
Survival/Condition	The survival of an assets archaeological potential both above and below ground is a particularly important consideration and should be assessed in relation to its present condition and surviving features.
Documentary Evidence	The significance of a Heritage Asset may be enhanced by the existence of records of previous investigation or, in the case of more recent assets, by the supporting evidence of contemporary written records
Potential	On occasion, the nature of the evidence cannot be specified precisely but it may still be possible to document reasons anticipating its existence and importance. This is usually confined to buried remains rather than upstanding Heritage Assets.
Diversity	Some Heritage Assets may possess a combination of high quality features, others a single important attribute.
Group Value	The value of a single Heritage Asset (such as a field system) may be greatly enhanced by its association with related contemporary assets (such as a settlement and cemetery) or with assets of different periods.
Fragility/Vulnerability	Highly important archaeological evidence from some field monuments can be destroyed by a single ploughing or unsympathetic treatment; there are also existing standing structures of particular form or complexity whose value can again be severely reduced by neglect or careless treatment.
Settlement	Listings

14.12.3 Similarly, where Heritage Assets do not have statutory designation their historical and aesthetic significance is determined through the use of the criteria defined below (Table 14.11). The aesthetic criteria do not

relate to buried archaeological remains as these are not visible above ground. The criteria are generally applied to non-designated buildings and structures, and to places (which are not considered here).

Table 14.11 - Definition of Historical and Aesthetic Significance

Criteria	Definition
Historical	This originates from the ways in which past people, events and aspects of life can be connected through a place to the present. This may include illustrative value, such as its connection to an important development, such as technology, or associative value, such as the connection to an important event or person.
Aesthetic	This is derived from the ways in which people draw sensory and intellectual stimulation from a place or building. These may be related to the design of a place, for example, through defensive reasons, or the informal development over time, such as the relationship of structures to their setting.

14.12.4 The consideration of the significance of Listed Buildings is reflected in their Grade and so it is not necessary to apply the criteria shown above to this type of Heritage Asset. Grade I listed buildings are those which are considered to be of exceptional national architectural or historic importance. Grade II* Listed Buildings are of particular national importance and special interest. Both Grade I and II* Listed Buildings are of great importance to the nation's built heritage and their importance will generally be beyond dispute. Grade II Listed Buildings are usually designated for their architectural and historic interest. They are usually of a more local or regional significance and make up around 95 per cent of all listed buildings. A plan showing the Listed Buildings within the 1 km Study Area is shown in Figure 14.2.

14.13 Statement of Significance

14.13.1 The Heritage Assets within the study area (**HA09**, **HA12**, **HA18**, **HA20**, **HA21**, **HA24**, **HA27**, **HA29**, **HA30**, **HA31** and **HA40**) have been considered using the criteria, with the results below. The Heritage Assets (**HA01**, **HA04-HA06**, **HA13**, **HA16**, **HA19**, **HA25**, **HA26**, **HA28**, **HA32-HA34**, **HA39**, **HA43-HA45** and **HA47**) outside of the study area, but within the 1 km Study Area have also been assessed as the development has the potential to impact on the setting of these in a

visual manner. Heritage Assets **HA02**, **HA03**, **HA07**, **HA08**, **HA10**, **HA11**, **HA14**, **HA15**, **HA17**, **HA22**, **HA23**, **HA35-HA38**, **HA41**, **HA42** and **HA45** are findspots lying outside The Project Site and therefore have not been considered as the development cannot impact on these assets.

14.13.2 Period: The medieval period Heritage Assets, such as the moated sites (**HA05**, **HA13**, **HA20**, **HA27**, **HA28** and **HA47**), the greens (**HA01**, HA04, **HA19** and **HA32**) and the churches (**HA06**, **HA16**) are typical features regionally within East Anglia. The Roman Road (**HA40**) is also characteristic of Roman roads across England and Europe. The WWII airfield (**HA31**) is also not an unusual feature in the English landscape and is characteristic of World War 2 airfields.

14.13.3 Rarity: Medieval churches were generally not built on greens and therefore the green at Mellis (**HA01**) and its associated church (Church of St Mary the Virgin), which is a Grade II* Listed Building (DSF6749) is considered to be a rare medieval settlement pattern (Suffolk HLC).

14.13.4 Documentation: The routes of Roman Roads have been well-documented (e.g. Margary 1973). Much of the medieval and post-medieval information is documented in the literature, such as Domesday Book and from cartographic sources. Other details could be discerned through further documentary research, but this would be unlikely to alter the results set out in this report.

14.13.5 Group value: The moated sites (**HA05**, **HA13**, **HA20**, **HA27**, **HA28** and **HA47**) have group value as they all had similar functions and forms. The greens (**HA01**, **HA04**, **HA19** and **HA32**) were part of the medieval agricultural landscape and can therefore be grouped together. The medieval churches (**HA06**, **HA16**) are linked through their religious functions.

14.13.6 Survival/Condition: As the majority of the study area comprises agricultural land, and although some ploughing may have been carried out, generally there is high potential for the survival of buried archaeological remains. Previous archaeological evaluations within the study area have not revealed any archaeological evidence, although an abundance of archaeology has been identified from excavations within the 1 km Study Area.

14.13.7 Fragility/Vulnerability: Any surviving field boundaries within the Project Site (**HA30**), which probably date to the medieval period, are vulnerable should any development take place. Any Heritage Assets that lie within the study area that will be impacted upon by any groundworks, such as cabling, access tracks, etc are vulnerable.

14.13.8 Diversity: The medieval landscape is relatively diverse with agricultural features, such as the greens (**HA01**, **HA04**, **HA19** and **HA32**) settlement, such as the moated sites (**HA05**, **HA13**, **HA20**, **HA27**, **HA28** and **HA47**) and religious sites, for example churches (**HA06**, **HA16**).

14.13.9 Potential: Within the study area, there is potential for buried archaeological remains as the land has continuously been used for agriculture since at least the medieval period. Field boundaries (**HA30**) are noted on both the tithe and OS mapping and appear to have the classic strip field layout of the medieval period. Its close proximity to the Roman Road (**HA40**) and the known settlement at Scole, just to the north of the 1 km Study Area, along with findspots of Romano-British pottery in the vicinity suggest there is high potential for Romano-British buried remains. The multi-period settlement site at Hartismere High School less than 1 km to the south-west of the study area, along with scattered findspots within the 1 km Study Area indicates high potential for archaeological buried remains dating from the Neolithic to the Anglo-Saxon period.

14.14 Preliminary Assessment of Potential Impacts

POWER GENERATION PLANT

Construction

14.14.2 There are no statutory designated heritage assets within the Power Generation Plant site . There are two non-designated assets within the Power Generation Plant site, these are:

- HA30 - Field boundary, and
- HA31/EYE072 – the former Eye Airfield

14.14.3 Additionally, there is potential for previously unknown heritage assets (buried archaeological remains) to be present within the Power Generation Plant site. It is anticipated that the construction phase will cause both direct and indirect adverse impacts.

14.14.4 There will be a direct impact on the two non-designated assets from construction related ground disturbance. There is also potential for a direct impact on previously unknown buried archaeological assets.

14.14.5 Although no listed buildings lie within the Power Generation Plant site it is considered that due to the low-lying nature of the local topography that there will be an indirect impact on the setting of quite a number of this asset type. As a worst-case scenario, the setting of 70 listed buildings could be subject to indirect impact. These are all located

within 1km of the Power Generation Plant site (Table below). As visual impact may extend further than 1km, the forthcoming final Cultural Heritage Chapter of the ES will consider a wider Study Area of 5km as agreed with English Heritage. This would almost certainly increase the number of listed buildings subject to impact. Table 14.12 provides a list of all the Listed Buildings within 1km of the proposed Power Generation Plant.

Table 14.12 - Listed building within 1 km of the Power Generation Plant Site

DSF: 4175; 4179; 3728; 3808; 3825; 3944; 4109; 4110; 4115; 4166; 4186; 4541; 4584; 4592; 4694; 4657; 5440; 5441; 5442; 5525; 5527; 4717; 4726; 4767; 4905; 4926; 4927; 5041; 5042; 5220; 5258; 5355; 5364; 5394; 5396; 5524; 5648; 5781; 5788; 5812; 5813; 5817; 5852; 6044; 6063; 6094; 6095; 6230; 6268; 6274; 6460; 6476; 6506; 6507; 6508; 6509; 6521; 6546; 6655; 6664; 6750; 6775; 6896; 6928; 6942; 6960; 6962; 6963; 6976; 7004; 17196

Operation

14.14.6 Following a suitable programme of archaeological mitigation there will be no direct impacts on either known or potential heritage assets throughout the operation phase of the plant.

14.14.7 Although sensitive mitigation could alleviate the effects of indirect impacts to a degree, it is anticipated that the indirect adverse impact on the setting of the listed buildings shown above (Table 14.12) will continue throughout the operation phase of the Power Generation Plant.

Decommissioning

14.14.8 There will be no direct impacts on either known or potential heritage assets throughout the decommissioning phase of the Power Generation Plant.

14.14.9 There will be an indirect positive impact on the setting of the listed buildings shown above in Table 14.12.

GAS CONNECTION ROUTE CORRIDOR OPTION 1

Construction

14.14.10 There are no statutory designated heritage assets within Gas Connection option1 and neither are there any non-designated assets within the option. There is potential for previously unknown heritage assets (buried archaeological remains) to be present within the option.

It is anticipated that the construction phase will have the potential to cause both direct and indirect adverse impacts.

14.14.11 There is potential for a direct impact on previously unknown buried archaeological assets.

14.14.12 Although no listed buildings lie within Gas Connection option 1, it is likely that due to the low-lying nature of the local topography that there will be an indirect impact on the setting of a number of this asset type. As a worst-case scenario the setting of approximately 30 listed buildings could be subject to indirect impact, although due to the nature of the works the significance of the effect would be very low and temporary. These buildings are all located within approximately 0.5 km of Gas Connection option 1

Table 14.13 - Listed Building within 0.5 Km of Gas Connection Route Corridor Option 1

DSF: 3944; 4109; 4110; 4541; 4584; 4592; 4624; 5440; 5441; 5442; 5220; 5258; 5648; 5812; 5852; 6094; 6095; 6268; 6274; 6506; 6507; 6508; 6509; 6521; 6750; 6896; 6928; 6942; 7004; 17196

Operation

14.14.13 Following a suitable programme of archaeological mitigation there will be no direct impacts on the potential heritage assets throughout the operation phase of Gas Connection option 1.

14.14.14 There will be no indirect impacts on the setting of the listed buildings throughout the operation of Gas Connection option 1.

Decommissioning

14.14.15 There will be no direct impacts on either known or potential heritage assets throughout the decommissioning phase of Gas Connection option 1. .

14.14.16 There could be a temporary indirect adverse impact on the setting of the listed buildings (Table 14.13) during this phase if infrastructure is removed from the routes. The effect would be of very low significance and temporary.

GAS CONNECTION ROUTE CORRIDOR OPTION 2

Construction

14.14.17 There are no statutory designated heritage assets within route Gas Connection option 2. There is one non-designated assets within Gas Connection option 2;

- MSF 27050 - Artefact scatter

14.14.18 Additionally, there is potential for previously unknown heritage assets (buried archaeological remains) to be present within Gas Connection option 2. It is anticipated that the construction phase will have the potential to cause both direct and indirect adverse impacts.

14.14.19 The construction works will potentially impact on the site of the artefact scatter, however, the artefacts (finds) have been removed from site and so the value or importance of the findspot relates to the potential for unknown associated heritage assets to be present rather than the artefacts.

14.14.20 There is potential for a direct impact on previously unknown buried archaeological assets.

14.14.21 Although no listed buildings lie within Gas Connection option 2 it is likely that due to the low-lying nature of the local topography that there will be an indirect impact on the setting of a number of this asset type. As a worst-case scenario the setting of 30 listed buildings (Table 14.13) could be subject to indirect impact, although due to the nature of the works significance of the effect would be low and temporary. These buildings are all located within approximately 0.5km of Gas Connection option 2.

Table 14.14 - Listed Building within 0.5 Km of Gas Connection Route Corridor Option 2

DSF: 3944; 4109; 4110; 4541; 4584; 4592; 4624; 5440; 5441; 5442; 5220; 5258; 5648; 5812; 5852; 6094; 6095; 6268; 6274; 6506; 6507; 6508; 6509; 6521; 6750; 6896; 6928; 6942; 7004; 17196

Operation

14.14.22 Following a suitable programme of archaeological mitigation there will be no direct impacts on the potential heritage assets throughout the operation phase of the Gas Connection option 2.

14.14.23 It is unlikely there will be indirect impacts on listed buildings throughout the operation of the Gas Connection option 2.

Decommissioning

14.14.24 There will be no direct impacts on either known or potential heritage assets throughout the decommissioning phase of Gas Connection option 2.

14.14.25 There could be a temporary indirect adverse impact on the setting of the listed buildings (Table 14.14 above) during this phase if infrastructure is removed from the routes. The degree of indirect impact would be very low significance and temporary..

ELECTRICAL CONNECTION OPTION 1 AND ELECTRICAL CONNECTION COMPOUND OPTION 1

14.14.26 There are no statutory designated heritage assets within the Electrical Connection Option 1 and Electrical Connection Compound Option 1. Five non-designated assets are present within this option area: :

- 12/YAX006 - Findspot/pottery
- 18/YAX007 - Findspot/flint
- MSF27002 - Findspot/bow brooch
- MSF047 - Findspot/artefact
- MSF030 - Findspot/metalwork

14.14.27 Additionally, there is potential for previously unknown heritage assets (buried archaeological remains) to be present within the option area. It is anticipated that the construction phase will have the potential to cause both direct and indirect adverse impacts.

14.14.28 The construction works will potentially impact on the site of the findspots, however, the artefacts (finds) have been removed from site and so the value or importance of the findspot relates to the potential for unknown associated heritage assets to be present rather than the artefacts.

14.14.29 There is potential for a direct impact on previously unknown buried archaeological assets.

14.14.30 Although no listed buildings lie within the option area it is likely that due to the low-lying nature of the local topography that there will be an indirect impact on the setting of a number of this asset type. As a worst-case scenario the setting of approximately 27 listed buildings could be

subject to indirect impact, although due to the nature of the works the significance of the effect would be low and temporary. The buildings are all located within approximately 0.5km of the Electrical Connection Option 1 and Electrical Connection Compound Option 1

Table 14.15 - Listed Building within 0.5 Km of Electrical Connection Option 1 and Electrical Connection Compound Option 1

DSF: 3825; 3944; 4109; 4110; 4115; 4541; 4624; 4717; 5041; 5440; 5441; 5442; 5258; 5648; 5812; 5817; 5852; 6268; 6274; 6476; 6506; 6521; 6664; 6960; 6750; 6896; 6942

Operation

14.14.31 Following a suitable programme of archaeological mitigation there will be no direct impacts on the potential heritage assets throughout the operation phase of the Electrical Connection Option 1 and Electrical Connection Compound Option 1.

14.14.32 There will be an indirect impact on listed buildings throughout the operation of the Electrical Connection Option 1 and Electrical Connection Compound Option 1 The significance of effect will be low.

Decommissioning

14.14.33 There will be no direct impacts on either known or potential heritage assets throughout the decommissioning phase of Electrical Connection Option 1 and Electrical Connection Compound Option 1

14.14.34 There could be a temporary indirect adverse impact on the setting of the listed buildings (Table 14.15) during this phase if infrastructure is removed from the routes. The degree of indirect impact would be very low significance and temporary.

ELECTRICAL CONNECTION OPTION 2 AND ELECTRICAL CONNECTION COMPOUND OPTION 2

14.14.35 There are no statutory designated heritage assets within the area for Electrical Connection Option 2 and Electrical Connection Compound Option 2. There are six any non-designated assets within the option area:

- 9/YAX005 - Findspot/lead seal
- MSF27032 - Findspot/key
- MSF27041 - Findspot/Flint
- MSF225 - Findspot/metalwork

- MSF237 - Findspot/metalwork
- MSF242 - Findspot/metalwork

14.14.36 Additionally, there is potential for previously unknown heritage assets (buried archaeological remains) to be present within the option area. It is anticipated that the construction phase will have the potential to cause both direct and indirect adverse impacts.

14.14.37 The construction works will potentially impact on the site of the findspots, however, the artefacts (finds) have been removed from site and so the value or importance of the findspot relates to the potential for unknown associated heritage assets to be present rather than the artefacts.

14.14.38 There is potential for a direct impact on previously unknown buried archaeological assets.

14.14.39 Although no listed buildings lie within the option area it is likely that due to the low-lying nature of the local topography that there will be an indirect impact on the setting of quite a number of this asset type. As a worst-case scenario the setting of approximately 27 listed buildings could be subject to indirect impact, although due to the nature of the works the significance of the effect would be very low and temporary. The buildings are all located within approximately 0.5 km of the Electrical Connection Option 2 and Electrical Connection Compound Option 2

Table 14.16 - Listed Building within 0.5 Km of Electrical Connection Option 2 and Electrical Connection Compound Option 2

DSF: 3825; 3944; 4109; 4110; 4115; 4541; 4624; 4717; 5041; 5440; 5441; 5442; 5258; 5648; 5812; 5817; 5852; 6268; 6274; 6476; 6506; 6521; 6664; 6960; 6750; 6896; 6942

Operation

14.14.40 Following a suitable programme of archaeological mitigation there will be no direct impacts on the potential heritage assets throughout the operation phase of Electrical Connection Option 2 and Electrical Connection Compound Option 2

14.14.41 There will be an indirect impact on listed buildings throughout the operation of the Electrical Connection Option 2 and Electrical Connection Compound Option 2. The significance of the effect will be low.

Decommissioning

14.14.42 There will be no direct impacts on either known or potential heritage assets throughout the decommissioning phase of the connection.

14.14.43 There could be a temporary indirect adverse impact on the setting of the listed buildings (Table 14.16) during this phase if infrastructure is removed from the routes. The significance of the effects would be very low significance and temporary.

14.15 Potential Mitigation / Management Techniques

14.15.1 Current legislation draws a distinction between archaeological remains of national importance and other remains considered to be of lesser significance. Those perceived to be of national importance may require preservation *in situ*, whilst those of lesser significance may undergo preservation by record, where Regional / County or Local / Borough significance can be demonstrated.

14.15.2 No buried archaeological sites have been identified within the study area that may be considered as being of national importance and therefore merit preservation *in situ*. However, the lack of development across the site increases the likelihood of survival of any below ground remains.

14.15.3 Following consultation with the Suffolk County Archaeologist, a programme of archaeological evaluation has been agreed. This will comprise a geophysical survey in the first instance. This non-intrusive investigation will be followed by a programme of archaeological trial trenching should the findings of the geophysical surveys necessitate. The trial trenches would be sited across the Power Generation Plant site in accordance with the results of the geophysical survey, and also along the Gas Connection option and the option for the Electrical Connection and Electrical Connection Compound once the preferred routes have been identified, although the potential impacts from either option do not vary) in order to assess the direct impacts on below ground archaeological deposits, and to determine their survival and character.

14.16 Preliminary Assessment of Residual Effects

14.16.1 On the basis of the preliminary historic environmental information and assessment described above, taking into account potential mitigation measures, likely significant effects cannot yet be been ruled out as a result of indirect visual impact on arising from the proposed Project. This applies for listed buildings within 1km of the proposed Project

14.16.2 Although some level of suitable screening may be achievable it is not always possible to mitigate against the effects of tall structures on the setting of heritage assets. There will be residual effects on the setting of the listed buildings, although this will be of low significance for the majority of the buildings.

14.16.3 The archaeological mitigation works will serve to preserve by record all the heritage assets (known and potential) which are subject to a direct impact. This will take place prior to construction and therefore there will be no residual effects remaining on these assets.

14.17 Next Steps

14.17.1 A written scheme of investigation detailing the archaeological mitigation and comprising a method statement will be compiled and submitted to the Suffolk County Archaeologist for comments.

14.17.2 The mitigation will include a programme of geophysical survey (magnetometer) to be undertaken within the proposed site of the Gas Generation Plant and the four connection corridors. This will inform intrusive site investigations (trial trenching), which will target areas of known archaeology and potential archaeology. It is likely that an archaeological watching brief will also be undertaken in specific areas.

14.17.3 Following the completion of the archaeological investigation a report and archive will be compiled.

SECTION 15

SOCIO ECONOMICS

15 SOCIO ECONOMICS

15.1 Introduction

15.1.1 The construction, operation and decommissioning phases of the proposed Project have the potential to affect the local area's labour market; community facilities and tourism sector. The assessment is based on the following elements (see Figure 4.2)

- Power Generation Plant;
- Gas Connection Route Corridor Option 1;
- Gas Connection Route Corridor Option 2;
- Electrical Connection Compound and Electrical Connection Option 1; and
- Electrical Connection Compound and Electrical Connection Option 2

15.1.2 Work completed for this PEIR includes a socio-economic policy review and baseline profile. A description of the proposed approach to the socio-economic assessment was also sent to key consultees. A number of responses have been received. Preliminary impacts are outlined in this PEIR based on the initial analysis. Further work, including business surveys, is programmed over the next 2 months. The combined findings will then be reported in the socioeconomic section of the ES to be submitted with the proposed DCO Application.

15.1.3 This socio-economic section of the PEIR is structured as follows:

- Legislative and policy context;
- Project Scenario for Assessment
- Assessment Methodology and Significance Criteria;
- Embedded Design Mitigation;
- Consultation;
- Baseline Conditions and Receptors
- Preliminary impact assessment;
- Potential Mitigation / Management Techniques;
- Preliminary Assessment of Residual Impacts; and
- Next Steps

15.2 Legislative and Policy Context

National Policy Statements

15.2.2 As explained in Section 2, the NPS EN-1 explains the assessment principles to which the SoS will have regard in the examination of an energy NSIP (such as the proposed Project), and explains the generic socio-economic impacts with regard to energy infrastructure. Specific considerations for fossil fuel generating stations are provided in the NPS for Fossil Fuel Generating Infrastructure (EN-2). The NPSs for Gas and Oil Pipelines (EN-4) and Electricity Networks Infrastructure (EN-5) provide specific considerations potentially relevant to the Gas Connection and Electrical Connection Compound and Electrical Connection respectively.

15.2.3 NPS EN-1 acknowledges that "the construction, operation and decommissioning of energy infrastructure may have socio-economic impacts at local and regional levels" (paragraph 5.12.1). At paragraph 4.2.2 it states that in addition to an ES prepared in accordance with the European Environmental Impact Assessment Directive "the [SoS] will find it helpful if the applicant sets out information on the likely significant social and economic effects of the development, and show how any likely significant negative effects would be avoided or mitigated. This could include employment, equality, community cohesion and well-being."

15.2.4 NPS EN-1 states that where the proposed project is likely to have socio-economic impacts at local or regional levels, the applicant should undertake and include in their application an assessment of relevant socio-economic impacts, which may include the creation of jobs and training opportunities; the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities; effects on tourism; and the impacts of a changing influx of workers during the different phases of the energy infrastructure.

15.2.5 It further notes that in making a decision on energy NSIP the Secretary of State may attribute limited weight to assertions of socio-economic impact that are not supported by evidence and may take into account mitigation such as planning obligations and particular options as to phasing the development in relation to impacts.

15.2.6 NPS EN-2 Fossil Fuel Electricity Generating Infrastructure should be considered alongside NPS EN-1. It emphasises the benefits of a low carbon economy including the likely "positive effects on the Economy and Skills, and Health and Well-being as secondary benefits and positive effects in the medium/long term on climate change."

15.2.7 NPS EN-4 Gas Supply Infrastructure and Gas and Oil Pipelines sets out policy for route selection for gas supply infrastructure and gas pipelines, along with likely impacts of their construction, commissioning and operation.

15.2.8 NPS EN-5 factors that should be taken into account related to route selection for developers, along with likely impacts of their construction, commissioning and operation.

15.2.9 While only a number of the impacts raised in the NPSs are considered likely to be relevant to the proposed Project, the socio-economic assessment may also take into account any relevant positive provisions the developer has made or is proposing to make to mitigate impacts (for example through planning obligations) and any legacy benefits that may arise as well as any options for phasing development in relation to the socio-economic impacts, to enable them to be considered by the Secretary of State for the purposes of decision-making.

Other National and Local Policy

15.2.10 Whilst the Planning Act 2008 is clear as to the primacy of the relevant NPS, other national and local planning policy can be considered important and relevant by the Secretary of State in the determination of an energy NSIP.

15.2.11 The National Planning Policy Framework (2012) (the NPPF) sets sustainable development at its core, stating that the policies set in paragraphs 18-219, taken as a whole, constitute the Government's view of what sustainable development in England means in practice for the planning system. It recognises that sustainable development has three dimensions: economic, social and environmental, and these are reflected in the 12 'Core planning principles'. Those of relevance to socio-economic impact assessment are:

- Proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs. Every effort should be made objectively to identify and then meet the housing, business and other development needs of an area, and respond positively to wider opportunities for growth. Plans should take account of market signals, such as land prices and housing affordability, and set out a clear strategy for allocating sufficient land which is suitable for development in their area, taking account of the needs of the residential and business communities;

- take account of and support local strategies to improve health, social and cultural wellbeing for all, and deliver sufficient community and cultural facilities and services to meet local needs.

15.2.12 These underpin the 13 ways of 'delivering sustainable development', the most relevant to the socio-economic impact assessment being listed below:

- Building a strong, competitive economy (1)
- Supporting a prosperous rural economy (3)
- Promoting healthy communities (8)

15.2.13 In relation to (1) it is stated that "the Government is committed to ensuring that the planning system does everything it can to support sustainable economic growth. Planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system" (paragraph 19). At paragraph 21 it is stated that "investment in business should not be over-burdened by the combined requirements of planning policy expectations. [Local] Planning policies should recognise and seek to address potential barriers to investment, including a poor environment or any lack of infrastructure, services or housing".

15.2.14 In relation to (3) it is stated at paragraph 28 that "planning policies should support economic growth in rural areas in order to create jobs and prosperity by taking a positive approach to sustainable new development. To promote a strong rural economy, local and neighbourhood plans should support the sustainable growth and expansion of all types of business and enterprise in rural areas (…)".

15.2.15 In relation to (8) it is stated at paragraphs 69 and 70 that (local) planning policies and decisions should develop a shared vision with communities of the environment and facilities they wish to see, and take an integrated approach to the location of economic uses of land. The consultation and publication of the Eye Airfield Development Brief by Mid Suffolk District Council is likely to represent one example of the application of this policy.

15.2.16 The **2012 Gas Generation Strategy** highlights that gas-fired power stations are relatively cost effective and quick to build. It states that these plants can "offer employment opportunities throughout the country".

15.2.17 **The UK Low Carbon Transition Plan** states, "Coal and gas will remain important to ensure our electricity supply is reliable and secure

as we move towards greater dependence on intermittent renewable sources like wind"

15.2.18 **The Mid-Suffolk Local Plan (1998)**[14] plan identifies the former Eye Airfield as having proposed uses for Industrial, commercial and business development. Policy E2 favours "industrial uses on allocated sites".

15.2.19 **The Mid Suffolk District Council Core Strategy (2008)** in conjunction with the Focused Review (2012) designate Eye as a town in the settlement hierarchy in Policy CS1 to which the majority of development will be directed. Policy CS6 refers to the provision of local services and infrastructure in conjunction with new development where appropriate, the overall aims including to reduce the need to travel, improving the safety and ease of accessing jobs, retail and other services by sustainable modes of transport, and to contribute to identified local infrastructure priorities. Policy CS11 seeks to ensure a sufficient supply of employment land, including by protecting existing designated employment land. Eye Airfield Industrial Estate and the former Eye Airfield itself are both identified as of 'medium' quality and previously developed land.

15.2.20 SCC commissioned a study (**West Suffolk Review of Employment Land (2008**)[15] in 2008 which recognises the former Eye Airfield as a local employment area. The former Eye Airfield is recognised as an appropriate location for industrial development.

15.2.21 **The Suffolk Growth Strategy (2013)** [16] outlines Suffolk's ambitions for the future. Energy is identified as being one of Suffolk's priority growth sectors because it has significant growth potential in terms of job creation. Suffolk's proximity to oil and gas resources gives it a "crucial advantage in the energy sector". By 2028 it is envisaged that "employment in the energy sector has more than doubled since 2013 and provides some of the highest value-added jobs in the county". It also seeks to help develop a "coordinated economic strategy which sets out how Suffolk will create more, higher value, high skill jobs and increase wealth across the county". The Strategy also analyses strengths and weaknesses of the Suffolk economy, places a spotlight on the challenges and opportunities ahead and defines how the county, district and borough councils will work together with local partners to create the right conditions for business growth.

14 http://www.midsuffolkdc.gov.uk/localplan/written/cpt6.htm#top

15 http://msdc.onesuffolk.net/assets/UploadsMSDC/Economy/Strategic-Planning-Policy/Local-Plan/Local-Plan-Mid-Suffolk/E6WestSuffolkELRMay09.pdf

16http://www.suffolk.gov.uk/assets/suffolk.gov.uk/Business/Business%20Services/Economic%20development/2013-05-08%20updated%20growth%20strategy.pdf

15.2.22 **Eye Airfield Development Framework (February 2013)**[17] was prepared to assist Mid-Suffolk council to manage and control development on the former Eye Airfield going forward to 2031. This site is recognised as having the potential to provide additional jobs for the area.

15.3 Project Scenario for Assessment

15.3.1 The features associated with a realistic worst case scenario differ depending on whether socio-economic, tourism or community infrastructure receptors are the subject of consideration. For example, while a CCGT plant with a greater concentration of generation equipment, a taller stack, and a larger footprint may have greater potential to cause adverse impacts on local tourism and recreation businesses, it would have a greater level of beneficial impact within the construction sector (providing labour requirements can be met locally). The respective 'worst case' socio-economic, tourism and community infrastructure effects in each area are indicated below.

Table 15.1 - Realistic Worst Case Scenario

Receptor	Worst case scenario effect
Socio-economic	Insufficient labour supply. Excessive in-migration of labour leading to labour market distortions.
Tourism	Major detrimental impact on areas tourism appeal and tourism product leading to tourism related business closures. And/or accommodation capacity issues arising from demand from the proposed Project construction workers
Community facilities	Major capacity pressures on education and health services in construction phase. Transport and physical severance issues leading to temporary/ permanent closure of community facilities

15.3.2 The project above is assessed against its potential to generate these types of impact

15.4 Assessment Methodology and Significance Criteria

15.4.1 The approach adopted to socioeconomic, tourism and community infrastructure assessment is summarised below.

17 http://www.midsuffolk.gov.uk/assets/UploadsMSDC/Economy/Economic-Development--Tourism/Economic-Development/Eye-Airfield-Newsletters/210213Eye-AirfieldDevelopmentFramework.pdf

Guidance

15.4.2 The assessment follows UK Government guidelines and best practice. The methodology used to estimate impacts follows guidance set out in the HM Treasury's Green Book18 and English Partnerships (EP) Additionality Guide, as well as taking into account the Department for Business Innovation and Skills research on additionality.[19]

Study Areas

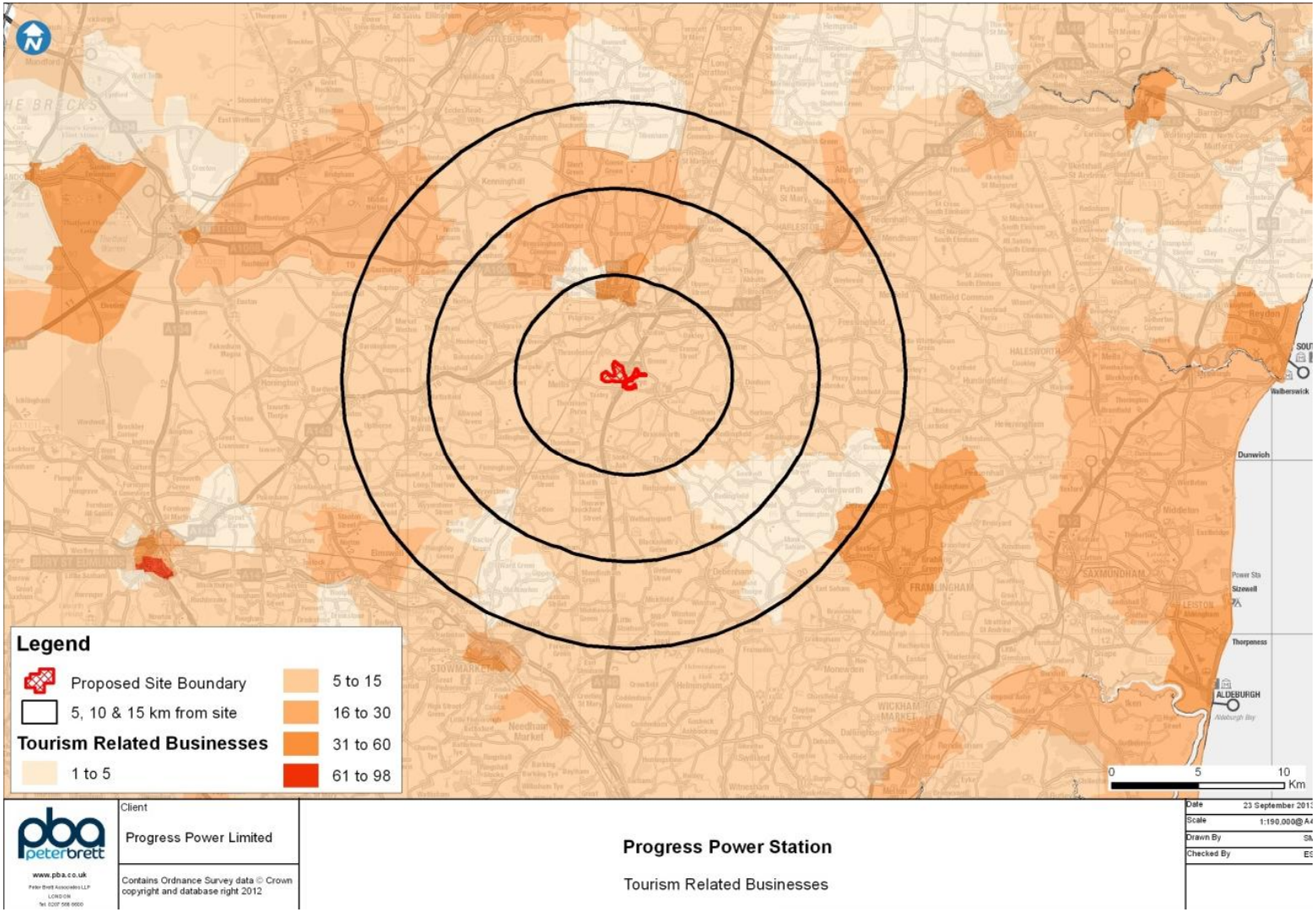
15.4.3 The following study areas have been used in this assessment. Given the adjacency of the different components common study areas have been adopted. The socio-economic and tourism study areas were defined in the consultation exercise on methodology with consultees:

- **Socio economic study area** - The study area for the socio-economic assessment is based on drive time catchment areas from the Project Site. The 'local area' is defined within a 30 minute drive time, 'wider area' within a 45 minute drive time, and 'wider region' within a 60 minute drive time (please see Insert 15.1)
- **Tourism study area** - The study area for the tourism assessment is defined by a 15 km radius from the Project Site. Facilities or notable points of focus of visitor attraction within this area have been reviewed. Any significant tourism facilities located just outside the boundary have also been included (please see Insert 15.2)
- **Community Infrastructure study area** - As proximity is likely to be the main determinant of impacts and their scale, the status (or catchment) of the community facility receptors in an area determines the scale and significance of any impacts. Whilst Eye is defined as a 'town' in the settlement hierarchy in the Core Strategy (2008), it has a population of some 2,000 people. Its community facilities are likely to serve a local area, their catchment not extending to settlements of similar or larger size. Effects will therefore tend to be limited to receptors in this local area. For this assessment, this is taken to be within a 5 km radius.

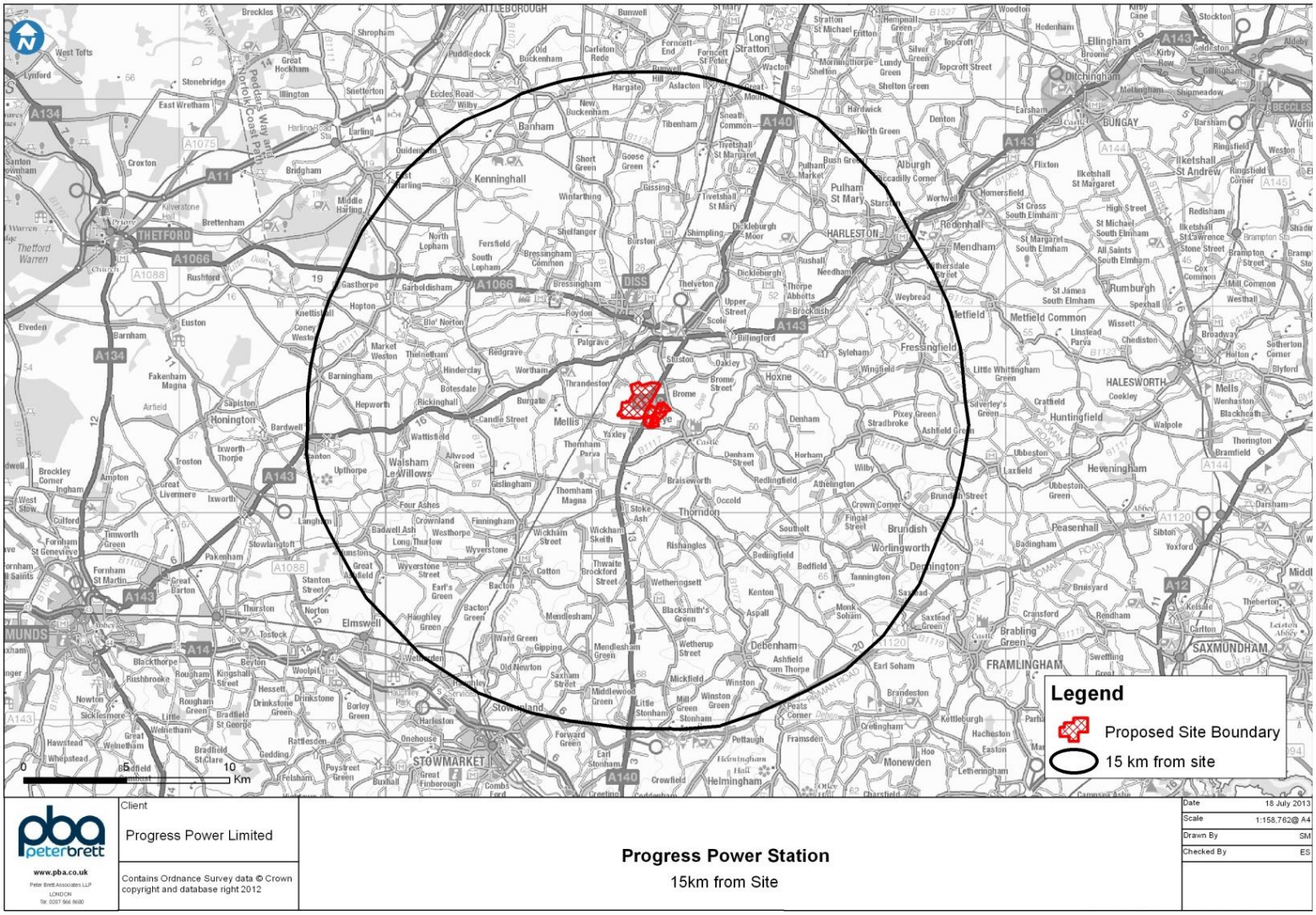
18 http://www.hm-treasury.gov.uk/d/green_book_complete.pdf

19 Additionality Guide – A Standard Approach to Assessing the Additional Impacts of Projects: English Partnerships (2008)

Insert 15.1 - Tourism Business Density Map



Insert 15.2- 15km Tourism Study Area



Approach

15.4.4 The main stages of the approach are as follows:

Review available data/information

15.4.5 Data and information from national, regional and local databases has been reviewed, identifying information gaps and requirements for data gathering e.g. business, supply chain and other surveys.

15.4.6 Comparative analysis

15.4.7 Data and information regarding the predicted and/or experienced socioeconomic effects of similar projects is being examined

Baseline

15.4.8 The Study area's socioeconomic position has been described using standard indicators. This provides a baseline from which potential impacts can be assessed:

- Economic: the area has been described using a combination of: standard sources and indicators: research available at study area level; and research into the business and labour market structure of the local economy.
- -Tourism: the area's visitor attraction has been profiled including: visitor attractions; visitor accommodation; tourism volume and value; and the local tourism economy.
- Social: Indices of deprivation and demographic structure have been examined. An audit of community infrastructure has been prepared.
- Policy Context: planning, economic development and other relevant policy have been reviewed to identify related economic, social and regeneration objectives which the Project may affect (whether contributing to their realisation or otherwise).

Assessment of potential economic impacts

15.4.9 A detailed assessment of likely effects on the local, regional and national economy during construction, operation and decommissioning of the proposed Project is being prepared. This will assess the scale of:

- Direct economic impacts: jobs and GVA that are wholly or largely related to construction, decommissioning, and operation and maintenance of the proposed Project

- Indirect economic impacts (positive and negative): jobs and GVA generated in the study area in the chain of suppliers of goods and services to the direct activities
- Induced economic impacts: jobs and GVA created by direct and indirect employees' spending in the study area or in the wider economy
- Wider economic (catalytic) impacts (positive and negative): employment and income generated in the economy related to the wider role of the proposed Project in influencing economic activities (including wider socio-economic effects).

Assessment of potential tourism impacts

15.4.10 Tourism and recreational behaviour will only be detrimentally affected where the effects of the proposed Project either changes the visitor/user pattern in terms of numbers, and /or their patterns of expenditure for the worse. As such, opportunities for tourist and visitor expenditure, any potential variation in expenditure or visitor numbers, and consequent effects on turnover or employment are of key importance.

15.4.11 A business survey will be carried out to gain a more detailed understanding of the local tourism economy and its current performance. Businesses that will be contacted include key visitor accommodation providers, leisure activity providers and other relevant tourism businesses.

15.4.12 Facilities or notable points of focus in the study area have been identified. Based upon the proposed Project's anticipated visibility, comment is provided on the likelihood of the proposed Project influencing visitor and tourist attitudes and behaviour towards these visitor facilities and locations.

15.4.13 The significance of tourism impacts will be determined through an understanding of the sensitivity of a receptor and the anticipated magnitude of effect.

Assessment of potential community infrastructure impacts

15.4.14 An assessment of the likely significant effects on local, regional and national community receptors during construction, operation and decommissioning of the proposed Project is being carried out. This assessment includes an audit of community infrastructure facilities/receptors within the local area and its associated effects (i.e. effects on local schools, local authority services and other infrastructure).

Mitigation measures

15.4.15 Where impacts are assessed as significant adverse, mitigation measures are outlined. As with impact identification, mitigation measures will be described discretely to address construction, operation and decommissioning impacts.

Conclusions on cumulative and residual effects

15.4.16 An assessment of cumulative and residual effects will be provided stating the likely cumulative impacts of the proposed Project with other projects in the study area or beyond; and in what way, if at all, the proposed Project would have post-mitigated or residual effects on its local and wider socio-economic context. Trans-boundary effects have been scoped out by the SoS.

15.4.17 This approach has been discussed with officers from Suffolk County Council and Mid-Suffolk District Council who have confirmed its appropriateness for the purpose of this assessment. It has also been sent to other statutory consultees for comment. At this time, a number of responses are still to be received

Sensitivity, magnitude and significance criteria

15.4.18 In addition to quantitative and qualitative assessment, impact significance is defined by the combination of the sensitivity of receptors and the magnitude of impacts on them. Criteria specific to socioeconomic factors have been adopted in defining the hierarchies of receptor sensitivity and impact magnitude.

Determining socio-economic sensitivity of effect

15.4.19 For economic impacts and effects (including employment), the availability of labour and skills is critical in accommodating the demands, needs and requirements of the proposed development. Adequate capacity results in a low sensitivity, while limited capacity results in a high sensitivity.

15.4.20 The key socio-economic indicators for the Study Area in relation to the criteria include:

- the proportion of skilled workforce in the study area relative to national averages
- educational attainment levels in relation to national averages
- the proportion of employment in relevant sectors (i.e. manufacturing and construction workers) in the Study Area

- the availability of labour (including the unemployed workforce)
- relevant education and training provision, including existing and proposed programmes provided by institutions serving the study area

Table 15.2 Socio-Economic Sensitivity Criteria

Sensitivity	Example
Very High	There is no availability of labour and skills in the area's workforce (this is dependent on specific project requirements and the degree to which they can be met in the Study area). The Project would lead to labour market pressure and distortions (i.e., skills and capacity shortages, import of labour, wage inflation).
High	There is low/limited availability of labour and skills in the area's workforce (The Project would lead to labour market pressure and distortions (i.e., skills and capacity shortages, import of labour, wage inflation).
Medium	The area has a constrained supply of labour and skills. The Project may lead to labour market pressure and distortions.
Low (or lower)	The receptor has a readily available labour force: some skill deficits. The Project is unlikely to lead to labour market pressure and distortions
Negligible	Where an effect would not be discernible; and/or where fewer than 10 jobs would be created or lost within the Study Area. and/or Effects would be temporary (i.e. experienced for less than one year).

Determining socio-economic magnitude of effect

15.4.21 The magnitude of the effect of potential socioeconomic impacts is assessed against the thresholds shown in Table15.3.

Table15.3 - Socio-Economics Magnitude Criteria

Magnitude		Example
Major	Adverse	Effects would be observed on an international, national or regional scale; where the number of jobs lost in the Study Area would be greater than 250 (based upon EU definition of small and medium enterprises). and/or Effects would be of long-term duration (i.e. greater than 5 years).
	Beneficial	Effects would be observed on an international, national or regional scale; where the number of jobs created in the Study Area would be greater than 250 (based upon EU definition of small and medium enterprises). and/or Effects would be of long-term duration (i.e. greater than 5 years).
Moderate	Adverse	Noticeable effects would arise that may be judged to be important at a local scale, either because there are large effects on few receptors or smaller effects on a larger proportion of receptors; where the number of jobs lost in the Study Area would be greater than 50, but fewer than 250. and/or Effects would be medium-term (i.e. 3-5 years).
	Beneficial	Noticeable effects would arise that may be judged to be important at a local scale, either because there are large effects on few receptors or smaller effects on a larger proportion of receptors; where the number of jobs created in the Study Area would be greater than 50, but fewer than 250. and/or Effects would be medium-term (i.e. 3-5 years).

Minor	Adverse	Small scale effects would arise, with a limited number of affected receptors; and/or where the number of jobs lost in the Study Area would be greater than 10, but fewer than 50. and/or Effects would be short-term (i.e. 1-2 years).
	Beneficial	Small scale effects would arise, with a limited number of affected receptors; and/or where the number of jobs created in the Study Area would be greater than 10, but fewer than 50. and/or Effects would be short-term (i.e. 1-2 years).
Negligible	Adverse	Very minor loss
	Beneficial	Very minor benefit
No Change		No change would be perceptible, either positive or negative.

Sensitivity of tourism receptor

15.4.22 Impact significance is determined through an understanding of the sensitivity of a receptor and the anticipated magnitude of effect.

15.4.23 In considering the level of tourism sensitivity, the standing of the receptor or resource is the defining factor. This is established against:

- Tourism business' relative attraction to customers from outside the Study Area and the proposed Project's potential to influence broader perceptions of the area. Where a majority of trade is non-local this is more likely to be the case;
- the relative importance of tourism as a business sector. Where tourism is more important relative to other sectors, impacts may have the potential to generate broader impacts. Similarly, where it is of relatively low significance, impacts on tourism and related sectors are unlikely to generate a high level of adverse impact across the broader economy.

15.4.24 The main factors relevant to this consideration are outlined Table 15.4.

Table 15.4 - Tourism Receptor Sensitivity

Sensitivity	Example
Very High	International status and/or high visitor numbers.
High	National status and/or high visitor numbers
Medium	Regional status and/or medium visitor numbers.
Low (or lower)	Local status and/or few visitor numbers.
Negligible	Sub local and/or minimal numbers.

Magnitude of tourism effect

15.4.25 The magnitude of effect is gauged by estimating the amount of change to the receptor arising from the proposed Project and relevant components. It is evaluated in line with the criteria set out in Table 15.5.

Table 15.5 - Tourism magnitude of Effect

Magnitude		Example
Major	Adverse	A permanent or long term adverse impact on the value of receptor.
	Beneficial	Large scale or major improvement of the facilities quality; extensive restoration or enhancement; major improvement of receptor quality.
Moderate	Adverse	An adverse impact on the value of receptor, but recovery is possible in the medium term and no permanent impacts are predicted.
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of receptors quality.
Minor	Adverse	An adverse impact on the value of receptor, but recovery is expected in the short- term and there would be no impact on its integrity.
	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on receptor.
Negligible	Adverse	Very minor loss
	Beneficial	Very minor benefit
No Change		No change would be perceptible, either positive or negative

Sensitivity of community infrastructure receptor

15.4.26 In considering the level of community infrastructure sensitivity, the area served by the facility or that from which people travel to access it is the defining factor.

Table 15.6 - Sensitivity of community infrastructure

Sensitivity	Example
Very High	Facility is of international importance e.g. Major research or academic centre
High	Facility is of national importance e.g. University, Centre of Excellence for health care
Medium	Facility is of regional importance e.g. hospital
Low (or lower)	Facility is of local importance e.g. GP facility, local schools, community centre

Magnitude of community infrastructure effect

15.4.27 Magnitude of effect will be gauged by estimating the amount of change on the receptor arising from the proposed Project. The magnitude of change will be evaluated in line with the criteria below.

Table 15.7 - Magnitude of community infrastructure

Magnitude		Example
Major	Adverse	A permanent or long term adverse impact on the integrity and value of a facility
	Beneficial	Large scale or major improvement of the facilities quality; extensive restoration or enhancement; major improvement of facilities quality.
Moderate	Adverse	An adverse impact on the value of a facility, but recovery is possible in the medium term and no permanent impacts are predicted.
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of a facilities quality.
Minor	Adverse	An adverse impact on the value of a facility, but recovery is expected in the short- term and there would be no impact on its integrity.
	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on attribute or a reduction in the risk of a negative impact occurring.
Negligible	Adverse	Very minor loss
	Beneficial	Very minor benefit
No Change		No change would be perceptible, either positive or negative.

Significance of Impact

15.4.28 In line with standard EIA practice, the sensitivity of receptors, as defined in the tables above are considered against the Magnitude of Effect to determine the significance of effect (Table 15.8).

Determining Significance of Effect

Table 15.8 – Significance of Effect

		Magnitude of Impact				
		No Change	***Negligible***	***Minor***	***Moderate***	***Major***
Receptor Sensitivity	***Very High***	Neutral	Slight	Moderate	Large	Very Large
	High	Neutral	Slight	Moderate	Large	Large
	Medium	Neutral	Slight	Slight	Moderate	Large
	Low	Neutral	Slight	Slight	Slight	Moderate
	Negligible	Neutral	Neutral	Neutral	Neutral	Neutral

Significance of Impact

15.4.29 Impact significance is the term used to categorise the impact, e.g. negligible, minor, moderate and major; and can be positive, neutral or negative. It takes into account the sensitivity of the receptor and the magnitude of effects in the EIA Methodology (Section 3)

15.5 Embedded Design Mitigation

15.5.1 The proposed Project has been designed from the outset to ensure its impacts are minimised. This includes mitigation that is embedded into the design of the Power Generation Plant, Gas Connection, Electrical Connection and Electrical Connection Compound and industry standard methods and procedures to ensure impacts from construction, operation and decommissioning are minimised.

15.5.2 In terms of tourism and recreation, the construction of the Power Generation Plant and the installation of the associated gas and electrical cables will be programmed wherever practicable to avoid particularly sensitive locations, recreational user viewpoints and corridors at peak user periods. For example the location of the Power Generation Plant is located in an industrial area thus reducing its visual impact.

15.6 Scoping Consultations

15.6.1 A range of consultations have been undertaken (involving local authorities, LEP representatives, business organisations, education and training providers etc.) to agree or refine methodology, to secure

relevant data; to ensure accurate interpretation of relevant policy; and to enable stakeholder views to inform the assessment. Responses to consultation to date are shown in the table below.

Table 15.8 Scoping Consultation

Consultee	Comment	Response to Consultation
Visit East Anglia, 7th August 2013	"I have reviewed the method statement and it all seems logical. My only comment would be the cumulative impact of this and other major projects happening in the region at roughly the same time and the potential for an overall reduction of leisure visitors to the area for long periods. Disruption of 'normal' availability of accommodation for leisure visitors could result in them choosing to visit another part of the country with the economic impact not only impacting the accommodation providers themselves but also the attractions, restaurants and bars who's income originates from those visitors." "Whilst there is a need for such projects here in East Anglia in order to create and support both direct and indirect employment, the potential impact on our £4.2bn visitor economy needs to be considered with appropriate measures to protect and ensure that any negative impacts taken into consideration."	A preliminary assessment is provided in this PEIR, and a more detailed assessment, which picks up these points will be covered the in ES,
English Heritage, 14th August 2013	"the visual impact assessment will to some degree overlap with the assessment of historic landscape and heritage assets which will form part of the Heritage Assessment. It might be useful to bear that in mind and for you to liaise with your colleagues carrying out the heritage assessment during preparation of that aspect of the Socio-Economic assessment."	A preliminary assessment is provided in this PEIR, and a more detailed assessment, which picks up these points will be covered the in ES,,

Norfolk County Council	The intended scope and approach of the socio-economic assessment as outlined in your letter dated 7 August appears very thorough and therefore aside from the comments already made I have no further comments.	n/a
Suffolk County Council	Suffolk County Council and Mid Suffolk County Council, think that “the approach seems appropriate”.	n/a
	They suggest that project details relating to employment “should include numbers and types, including skill levels”.	Covered in ES baseline
	The social baseline should contain information about skill levels.	A preliminary assessment is provided in this PEIR, and a more detailed assessment, which picks up these points will be covered the in ES
	Need to differentiate between construction and operational impacts here. Negative tourism impacts during construction would be from general disruption/traffic, but operationally from visual impacts. The impact on accommodation/services would also differ between construction and operation due to different numbers of workers (clarification of maintenance regime/outages work?). You propose to evaluate tourist impacts out of main season. The EIA will of course need to present a worst-case scenario, so if you do not assess for impacts during the high season, that would logically not permit works to occur in the main season as that would take you out of the scope of the ES.	Disagree, as respondents will be asked to provide tourism business information for both peak and off peak seasons. The timing of the survey ensures better response rates.

	Our approach to mitigation for socio-economic impacts is to; 1. secure early and strong commitment from developers to work with local stakeholder to maximise the local economic development opportunities arising from the development. 2. secure early discussions with developers over a long term skills plan which will meet the construction and operational needs of the development and aligns with local initiatives that are underway More detail on the proposals to promote local recruitment (Scoping Report 5.12.1) would also be useful.	Covered in ES
Sport England	"From a Sport England perspective the document covers the key areas of concern that we would have with regards to any development". Sport England asked for clarification on the following points: "Clarity on the impact on existing sports facilities as a result of the development. Will any facilities be lost due to the site development? Will access to any existing facilities be reduced? If so how will this be mitigated? Will access to existing facilities be impacted during the construction phase? If so how will this be mitigated? Will the development result in a deviation of routes to access existing facilities? If so what time impact will this have for existing users to get to any given site? Drive time for sports facilities is normally expected to be no more than 20 minutes? Will there be any significant population growth as a result of the development? If so what impact does this have on existing sports pitches and sports facilities? Does the local authority have a playing pitch and sports facilities strategy and what capacity in provision does it identify? Do existing facilities have capacity to accommodate additional demand? If not what is the solution?"	A preliminary consideration of sports facilities and activities is provided in PEIR baseline, and a more detailed assessment, which picks up these points will be covered the in ES

15.7 Preliminary Assessment

15.7.1 The findings of the stages of the socioeconomic assessment completed to this point are described below

Baseline Conditions and Receptors

Socio-economic baseline

15.7.2 This socio-economic profile examines the key indicators and measures of socio-economic activity in the Study Area. It sets a context for the assessment and highlights key economic issues.

Population

15.7.3 The local, wider area and wider region has experienced relatively significant population increases since 2001, a trend which is expected to continue over the coming years to 2021. Over the same period the population of the UK as a whole is also expected to increase but at a lesser rate.

Table 15.9 Population

	Local Area	Wider Area	Wider Region	United Kingdom
Population (2001)	59,427	296,498	859,486	58,791,895
Population (2012)	63,703	330,626	960,747	63,077,494
Population (2021)	69,338	365,537	1,061,532	66,980,590
% change				
2001-2012	7.20%	11.51%	11.78%	7.29%
2012-2021	8.85%	10.56%	10.49%	6.19%

Source: Experian 2013

Age Structure

15.7.4 The local area has a declining proportion of working age people and an increasing dependency ratio[20] which is likely to put additional pressure on services in the area. By 2021 over a quarter of the local area's population is expected to be of retirement age. This is greater than the projected UK averages.

[20] The dependency ratio (or proportion of working age people) is significant as it measures the relationship between the productive element of a population and the economically dependent

Table 15.10 Age Structure

	Local Area	Wider Area	Wider Region	United Kingdom
2001				
Children (0-15)	19%	19%	19%	20%
Working age (16-64)	62%	62%	63%	64%
Retirement age (65+)	19%	18%	18%	16%
2012				
Children (0-15)	17%	18%	17%	18%
Working age (16-64)	60%	62%	63%	64%
Retirement age (65+)	23%	20%	20%	17%
2021				
Children (0-15)	17%	17%	17%	19%
Working age (16-64)	56%	60%	60%	62%
Retirement age (65+)	27%	23%	22%	19%

Source: Experian 2013

Economic Activity

15.7.5 The economic activity rate is a useful measure of the labour market opportunities available in the area[21]. The local area's level of economic activity is comparable to the national average.

[21] The economic activity rate measures the percentage of the population, both in employment and unemployed that represent the labour supply regardless of their labour status. The figure represents the degree of success of the area in engaging people in productive activity.

Table 15.11 Economic Activity

	Local Area	Wider Area	Wider Region	United Kingdom
Total people (16-74)	46,980	236,249	683,119	41,126,561
Economically Active (%)	70%	72%	71%	70%
Economically Inactive (%)	30%	28%	29%	30%

Source: Experian 2013

15.7.6 The proposed Project's local area is characterised by relatively low levels of unemployment. Rural areas typically have higher levels of self-employment. The proportion of self-employed workers in the local area is higher than the national average indicting relatively high levels of entrepreneurship. However, the proportion of retired people in the local area is particularly high. Nonetheless, overall the local labour market is generally comparable with the wider area, region and national averages.

Table 15.12 Economic Activity by Type

	Local Area	Wider Area	Wider Region	United Kingdom
Economically Active				
Employee (%)	22%	22%	22%	20%
Self-employed with employees (%)	51%	54%	55%	55%
Self-employed w/out employees (%)	20%	15%	14%	14%
Unemployed (%)	4%	5%	5%	6%
Full-time student (econ active) (%)	3%	4%	4%	5%
Economically Inactive				
Retired (%)	63%	56%	54%	46%
Student (economically inactive) (%)	10%	14%	14%	19%
Looking after home/family (%)	14%	14%	14%	14%
Permanently sick/disabled (%)	9%	11%	11%	14%
Other economically inactive	5%	5%	6%	7%

Source: Experian 2013

Employment Structure

15.7.7 Retail occupations are the main employment category in the local area. Employment in health and social work, manufacturing and construction is also high. Agriculture, manufacturing and construction employment in the local area is above the national average however, as in many rural areas, the proportion of people who work in finance and real estate is low.

Table 15.13 Employment Structure

	Local Area	Wider Area	Wider Region	United Kingdom
Agriculture; hunting; forestry, fishing	5%	3%	2%	1%
Mining, Quarrying and Construction	10%	8%	8%	8%
Manufacturing	11%	10%	9%	9%
Electricity; gas and water supply	1%	1%	1%	1%
Wholesale and retail trade	17%	17%	17%	16%
Accommodation and catering	4%	5%	5%	6%
Transport storage and communication	8%	8%	8%	9%
Financial and insurance activities	3%	4%	5%	4%
Real estate activities	1%	1%	1%	1%
Administrative and support service activities	4%	4%	4%	5%
Professional, scientific and technical activities	7%	6%	5%	7%
Public administration and defence	4%	5%	6%	6%
Education	9%	10%	9%	10%
Health and social work	11%	12%	13%	13%
Other	5%	5%	5%	5%

Source: Experian 2013

Tourism Employment

15.7.8 The level of tourism related employment in Mid Suffolk has increased moderately recently. Mid Suffolk has a below average proportion of tourism related jobs compared to the national average.

Table 15.14 Tourism Employment

	2006		2007		2008 [22]	
	No.	%	No.	%	No.	%
MSDC	1,600	5.1	1,700	5.5	1,800	5.6
Great Britain	-	8.3	-	8.2	-	8.2

Source: NOMIS ONS annual business inquiry employee analysis

Social Grade

15.7.9 National Readership Survey (NRS) social grades are a system of demographic classification widely used in market research[23]. Compared to the national average the local area has a comparable proportion of people in the highest social grades (AB). It also has a lower proportion of people in lowest social grades (DE) compared to the national average. The local area's social grade characteristics are generally comparable to the wider area and region. However, the local area does have a significantly higher proportion of people employed in skilled manual labour.

Table 15.15 National Readership Survey (NRS) Social Grade

	Local Area	Wider Area	Wider Region	United Kingdom
AB - High/intermed mgr/admin/prof	22%	22%	21%	23%
C1 - Supervis/clerical/jr mgr/admin/prof	29%	30%	30%	31%
C2 - Skilled manual	28%	24%	23%	21%
DE - Semi-skilled/unskilled manual/State benefit/unempl/lowest grade	21%	24%	25%	26%

Source: Experian 2013

[22] Most recent data available as at July 2013

[23] Originally developed by the National Readership Survey (NRS). Now used by many other organisations for wider applications and a standard for market research.

Qualifications

15.7.10 The local area's educational attainment rate is lower than regional and national levels, with a lower proportion of people achieving the highest levels of qualifications and a higher proportion of people with no qualifications.

Table 15.16 Qualifications[24]

	Local Area	Wider Area	Wider Region	United Kingdom
Level 4/5	25%	26%	24%	27%
Level 3	12%	12%	12%	12%
Apprenticeship	4%	4%	4%	4%
Level 2	17%	16%	16%	15%
Level 1	15%	14%	14%	13%
Other qualifications	4%	5%	5%	6%
No Qualifications	25%	23%	24%	23%

Source: Experian 2013

Socio-economic Summary

15.7.11 The local area surrounding the proposed Project is characterised by:

- An increasing population (2001-2012), consistent with wider area, region, county and national trends;
- Projected population increase of 9% between 2012 and 2021, which is higher than the national average;
- a high and growing retirement age population;
- an economic activity rate comparable to the UK as a whole but lower than the wider area and region;
- relatively low levels of unemployment;

[24] Level 1: qualifications cover: 1+'O' level passes; 1+ CSE/GCSE any grades; NVQ level 1; or Foundation level GNVQ.

Level 2: qualifications cover: 5+'O' level passes; 5+ CSE (grade 1's); 5+GCSEs (grades A-C); School Certificate; 1+'A' levels/'AS' levels; NVQ level 2; or Intermediate GNVQ.

Level 3: qualifications cover: 2+ 'A' levels; 4+ 'AS' levels; Higher School Certificate; NVQ level 3; or Advanced GNVQ.

Level 4: Qualifications cover: First Degree, Higher Degree, NVQ levels 4 and 5; HNC; HND; Qualified Teacher Status; Qualified Medical Doctor; Qualified Dentist; Qualified Nurse; Midwife; or Health Visitor.

- a high proportion of people working in the retail industry;
- higher than average manufacturing, construction and agriculture employment;
- a relatively high proportion of people employed in skilled manual labour;
- a lower than average proportion of people in the higher class social grades compared to UK figures;
- Slightly below average education attainment levels.

Socio Economic and Labour Market Sensitivity

15.7.12 The socio-economic profile outlined above indicates that a constrained supply of labour and skills. The proposed Project may lead to labour market pressure and distortions (i.e. wage inflation, skills and capacity shortages, import of labour).

15.7.13 The overall sensitivity of the labour market is assessed as low/ medium.

Tourism Context

15.7.14 This section provides a tourism profile of the East of England specifically Suffolk and Norfolk in terms of visitor and tourist trends, tourism volume and value, visitor patterns, visitor accommodation, occupancy rates and expenditure patterns. The most up-to-date sources of information have been used. Where possible figures for MSDC are used in preference to the wider Suffolk County area as the proposed development is located in this council boundary.

15.7.15 East of England Key Visitor Attractions and Activities

15.7.16 Visit England carries out an annual survey of patronage of visitor attractions in the East of England. Table 15.14 details the top 10 unpaid and paid visitor attractions, with Ferry Meadow Country Parks and Colchester Zoo the most popular paid and unpaid attractions respectively. None of these attractions are located close to (i.e. within 15km of) the Project Site.

Table 15.17 Top 10 Paid & Unpaid Visitor Attractions 2011

East of England Top 10 Unpaid & Paid Visitor Attractions (2011)[25]		
	Attraction Name	Visitors 2011
Unpaid	Ferry Meadows Country Parks	986,264
	Hatfield Forest Country Parks	420,000
	Wroxham Barns	325,000
	Needham Lake and Nature Reserve Wildlife	311,200
	Nowton Park Country Parks	309,549
	Fairlands Valley Park	250,000
	Stockwood Discovery Centre Museums & Art Galleries	210,928
	Dunwich Heath Coastal Centre and Beach Wildlife	200,000
	Norwich Castle Museum and Art Gallery Museums & Art Galleries	170,151
	Cathedral and Abbey Church of St Alban	170,000
Paid	Colchester Zoo Wildlife	881,362
	ZSL Whipsnade Zoo Wildlife	502,785
	Willows Farm Village Farms	494,000
	Imperial War Museum Duxford Museums & Art Galleries	415,618
	Anglesey Abbey, Gardens and Lode Mill Historic Properties	272,391
	Southend-on-Sea Pier Historic Properties	270,000
	Cambridge University Botanic Garden Gardens	205,377
	Ickworth House, Park and Gardens Historic Properties	177,001
	BeWILDerwood Leisure & Theme Parks	168,312
	Blickling Hall, Gardens and Park Historic	151,166

[25] http://www.visitengland.org/Images/Top%2020%20Free%20Attractions%20-%20East%20of%20England%202011_tcm30-33753.pdf

	Properties	

15.7.17 The International Passenger Survey is carried out annually and in it visitors to the UK are asked what activities they undertake whilst visiting. Between 2006 and 2009 the top three most popular activities in the East of England were to 'eat in restaurants', 'go to a pub' and 'shop for clothes and accessories'. Other activities included 'sightseeing of famous monuments', 'visiting the countryside and villages,' and 'going to museums'. Less prominent activities include golf, researching ancestry and visiting spa/beauty centres.

Visitor Accommodation

15.7.18 In 2012 Visit England carried out an accommodation stock audit in the East of England. This audit profiled the type of establishments in the area, and specified the number of bed-spaces contained within them.

15.7.19 Both Mid Suffolk and South Norfolk have a low proportion of serviced and non-serviced establishments in their wider county regions. Mid Suffolk accounts for 12% of serviced and 8% of non–serviced establishments in Suffolk, while South Norfolk accounts for 10% and 5% of serviced and non-serviced establishments respectively in Norfolk.

15.7.20 Both areas also account for a low proportion of bed-spaces (both serviced and non-serviced) in their county regions.

15.7.21 The low concentration of accommodation provision in Mid Suffolk and South Norfolk indicates that neither area is considered among the main visitor destinations in their respective counties.

Table 15.18 Serviced and Non-Serviced Accommodation

	Mid Suffolk	South Norfolk	Suffolk	Norfolk	East of England
Number of Serviced establishments	56	76	454	783	2,386
% of East of England total	2%	3%	19%	33%	100%
Number of serviced bed-spaces	1086	1,425	9,059	15,852	82,562
% of East of England total	1%	2%	11%	19%	100%
Number of non-serviced establishments	72	78	869	1,480	2,734
% of East of England total	3%	3%	32%	54%	100%
Number of non-serviced bed-spaces	601	449	7,395	26,815	69,421
% of East of England total	1%	1%	11%	39%	100%
Number of Serviced establishments	56	76	454	783	2,386

Source: East of England Regional Summary (Visit England)

Domestic Trips Nights and Spend

15.7.22 Both Mid Suffolk and South Norfolk account for a low proportion of the East of England's domestic tourism volume and value. For the most recent reporting period 2009-2011 Mid Suffolk accounts for just 4% of trips, 4% of nights and 2% of spend across Suffolk. Similarly, South Norfolk accounts for 2% of trips, 1% of nights and 2% of spend in Norfolk. Neither Mid Suffolk nor South Norfolk are considered key tourist destinations for domestic visitors.

Table 15.19 Domestic Trips, Nights and Spend

					Average annual				
			Trips (000s)		Nights (000s)			Spend (£M)	
	2007-9	2008-10	2009-11	2007-9	2008-10	2009-11	2007-9	2008-10	2009-11
Mid Suffolk	65	72	64	187	189	180	8	6	4
South Norfolk	85	77	52	235	208	144	13	13	11
Suffolk	1,674	1,585	1,603	5,360	4,883	5,136	235	219	220
Norfolk	2,933	2,885	3,084	11,230	11,200	11,614	538	546	561
East of England	10,210	9,632	9,994	31,382	29,567	30,063	1,405	1,346	1,385
England	98,724	97,516	100,682	302,767	296,377	300,915	16,414	16,314	16,924

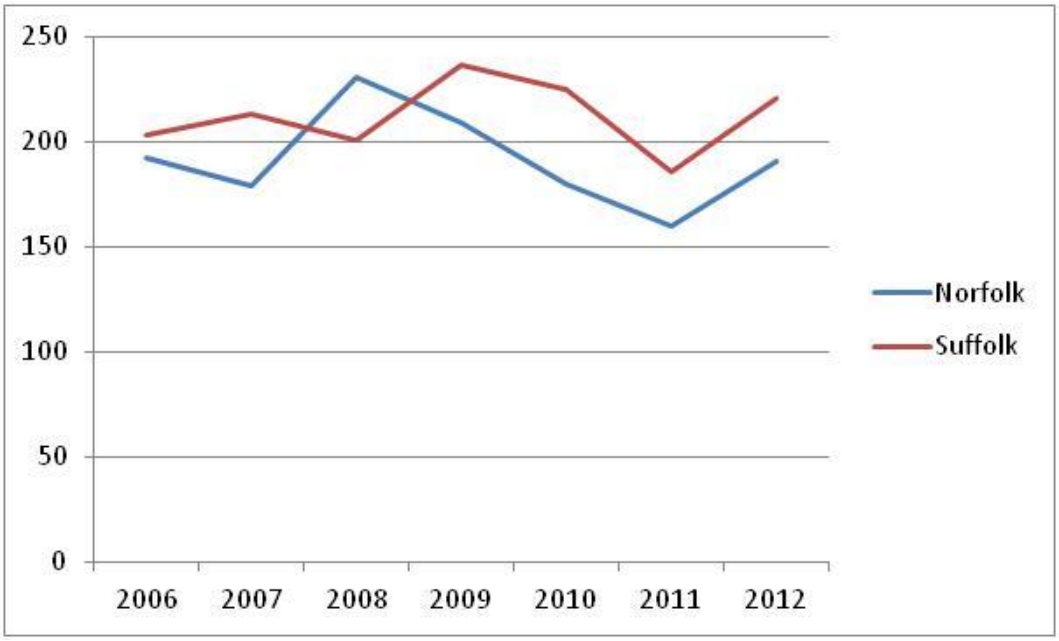
Source: Tourism - Domestic Trips, Nights and Spend. Source: GBTS Analysis 2007 -2011 (VisitEngland)

Overseas Visitor Trips

15.7.23 Insert 15.3 shows that in terms of overseas tourism, visitor numbers to both Suffolk and Norfolk have fluctuated between 2006 and 2012. In this period Suffolk went from 237,000 visitors in 2008 to a low of 186,000 in 2011. Norfolk recorded its highest number of visitors (231,000) in 2008 and its lowest (160,000) in 2011. This reduction can be expected due to the current economic climate and more people choosing to holiday at home. However, both areas have noted recent increases in their visitor numbers.

15.7.24 In 2012, Suffolk and Norfolk accounted for 11% and 10% respectively of trips in the East of England. Other parts of the East of England such as Cambridgeshire and Essex each account for around a quarter of trips.

Insert 15.3 - Overseas Trips (000's)



15.7.25 Source: Office for National Statistics, International Passenger Survey

15.7.26 Visiting friends and relatives is the most popular common factor influencing overseas visits to Suffolk and Norfolk.

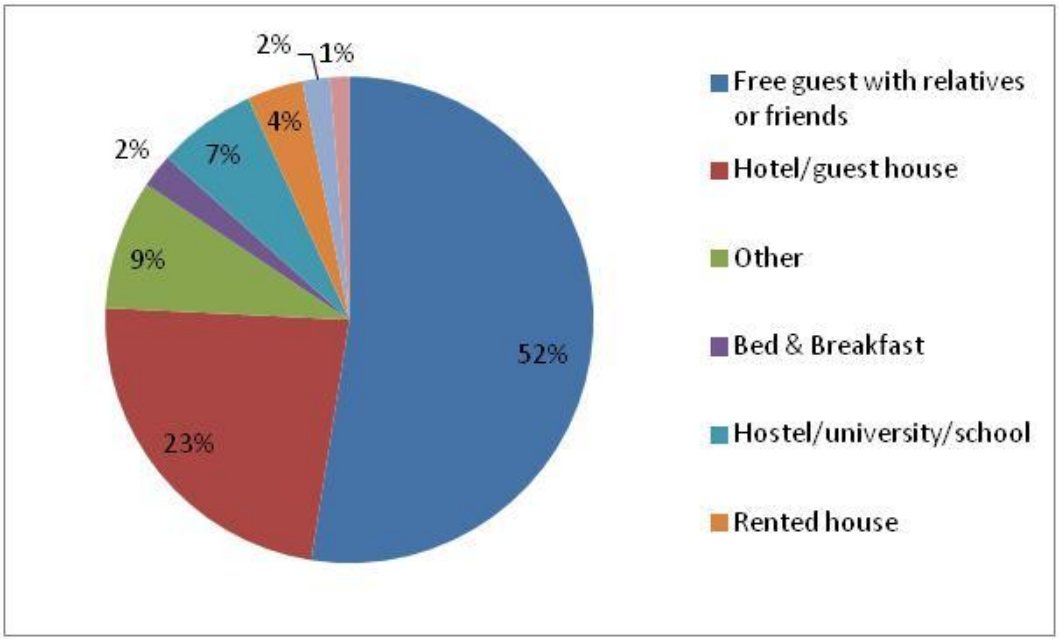
Table 15.12 East of England Purpose of Overseas Visits (000's)

	Holiday	VFR	Business	Other	Study
Suffolk	22%	45%	23%	7%	3%
Norfolk	29%	53%	16%	2%	1%

Source: Office for National Statistics, International Passenger Survey

15.7.27 In Suffolk the total number of overseas trips in 2012 was recorded at 221,000. Accommodation used for these staying visits is recorded in Insert 15.4. The majority of visitors stayed in the homes of relatives or friends. Nearly a quarter stayed in hotels.

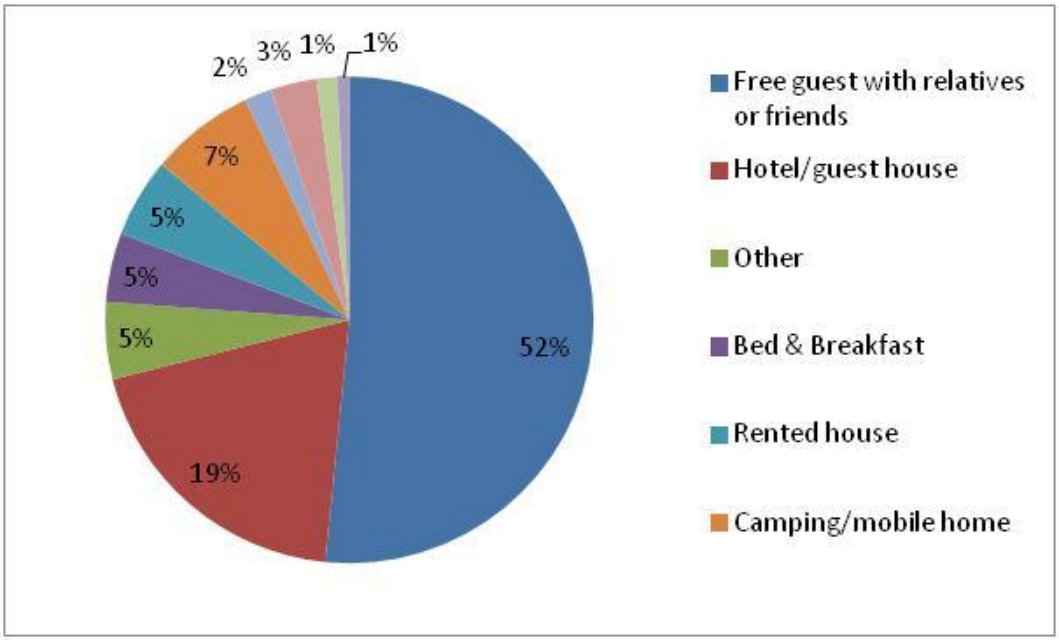
Insert 15.4 - Suffolk accommodation used for staying visits (2012)



Source: Office for National Statistics, International Passenger Survey

15.7.28 In Norfolk in 2012 total overseas trips totalled 191,000. As with Suffolk the majority of visitors stayed with relatives or friends.

Insert 15.5 - Norfolk accommodation used for staying visits (2012)



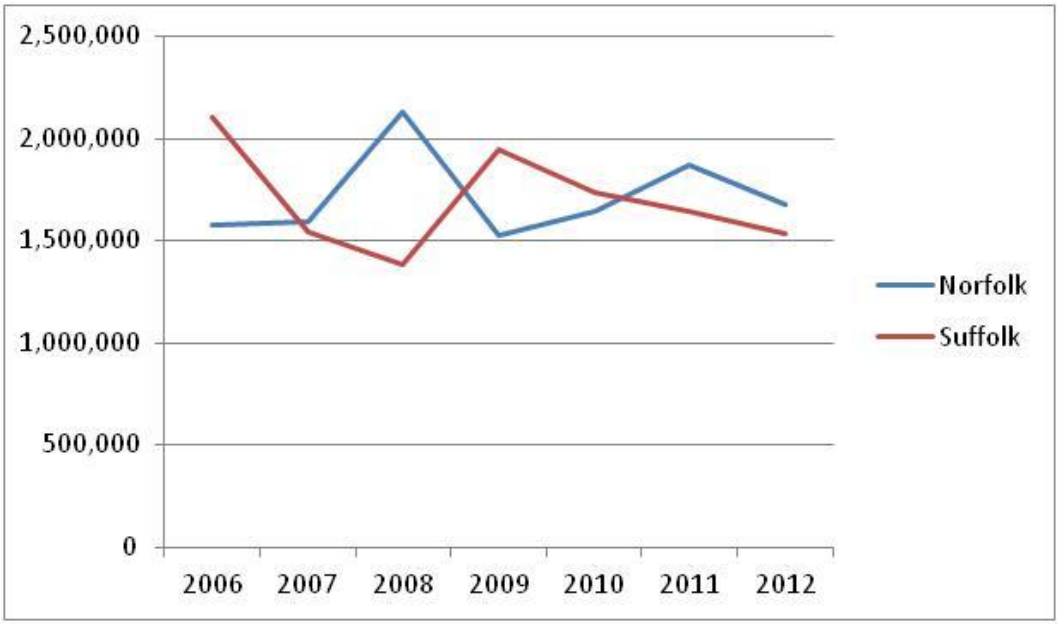
Source: Office for National Statistics, International Passenger Survey

Overseas Visitor Nights

15.7.29 The number of overseas visitor nights has fallen recently in both Suffolk and Norfolk. In Suffolk numbers have fallen from a high of 2.1 million nights in 2006 to 1.5 million nights in 2012. In Norfolk nights have gone from a high of 2.1 million nights in 2008 to 1.6 million nights in 2012.

15.7.30 In 2012 there were 14.3 million overseas visitors' nights in the East of England. Suffolk (11%) and Norfolk (12%) account for just under a quarter of trips in the East of England region. Overseas visitors preferred to stay in locations in Cambridgeshire and Essex, which accounted for 31% and 21% respectively of overseas nights.

Insert 15.6 - Overseas Nights (000's)



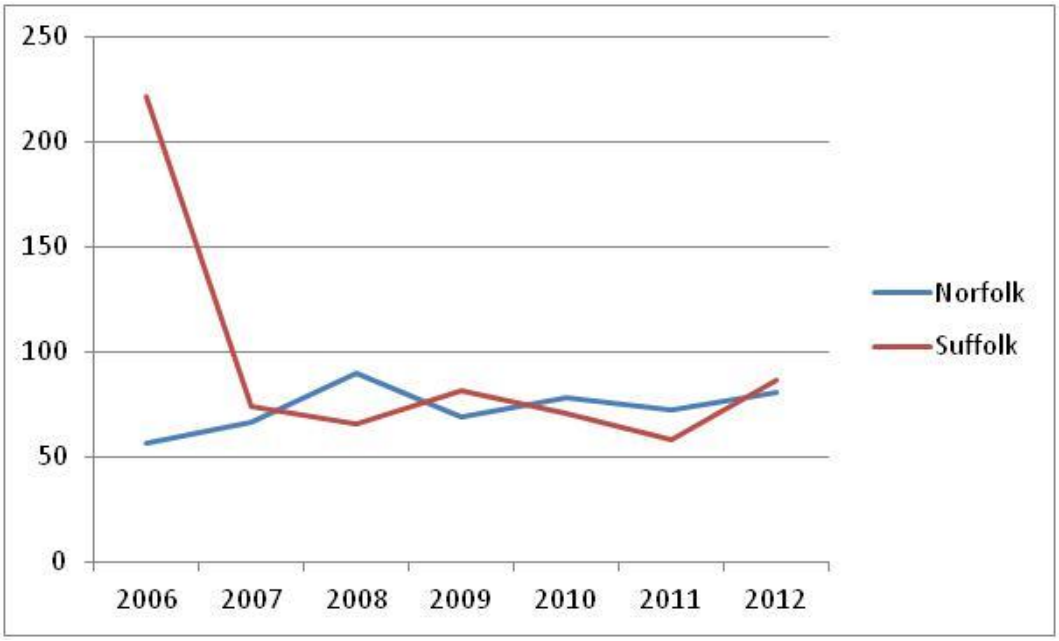
Source: Office for National Statistics, International Passenger Survey

Overseas Visitor Spend

15.7.31 Overseas visitor spend in Suffolk and Norfolk has remained fairly consistent between 2007 and 2012. However, spend in Suffolk fell significantly from a high of £222 million in 2006. In 2012 Suffolk and Norfolk both noted increases in overseas visitor spend relative to the previous year.

15.7.32 In total, visitor spend in the East of England in 2012 was £773 million. Suffolk (£86 million) and Norfolk (£81 million) each account for just over a tenth of the total visitor spend in the wider region. Cambridgeshire (£265 million), Essex (£139 million) and Hertfordshire (£132 million) all account for higher overseas visitor expenditure. This highlights the relative tourism attraction of Suffolk and Norfolk in the East of England context.

Insert 15.7 - Spend (£millions) (2012 prices)



Source: Office for National Statistics, International Passenger Survey

Profile of Tourism Business

15.7.33 Table 15.13 - Profile of Tourism Businesses within 5 and 15km of Project Site (2003 & 2008) shows the number of tourism related businesses within 5km and 15km of the Project Site by category in 2003 (earliest year available) and 2008. The composition of tourism businesses remained relatively constant over the 5 year period. In the 5km area there has been a 5% increase in tourism related businesses between 2003 and 2008. Similarly in the 15km area there has been a 1% increase in tourism related businesses. In the 15km area nearly half of the businesses in 2008 were either restaurants or bars.

15.7.34 In the 15km area there are a total number of 5194 businesses, of which 8% are tourism businesses. This shows that tourism businesses do not form a significant proportion of businesses in the area. In the 5km area there are a total of 1293 businesses, of which 8% are tourism businesses. The low proportion of tourism businesses indicates that tourism is not the main drivers of the local economy.

Table 15.13 - Profile of Tourism Businesses within 5 and 15km of Project Site (2003 & 2008)

	Hotels	Other Accommodation	Restaurants	Bars	Tour operators	Entertainment	Library, museum, cultural activities	Sporting activities	Arts	Other recreational activities	Total
5km											
2003	3 (3%)	2 (2%)	24 (24%)	30 (30%)	4 (4%)	2 (2%)	3 (3%)	14 (14%)	15 (15%)	2 (2%)	99
2008	6 (6%)	1 (1%)	22 (21%)	30 (29%)	6 (6%)	1 (1%)	2 (2%)	15 (14%)	16 (15%)	5 (5%)	104
15km											
2003	8 (2%)	13 (3%)	66 (16%)	131 (32%)	15 (4%)	10 (2%)	14 (3%)	65 (16%)	72 (17%)	19 (5%)	413
2008	13 (3%)	17 (4%)	73 (17%)	125 (30%)	15 (4%)	11 (3%)	12 (3%)	71 (17%)	62 (15%)	19 (5%)	418

15.7.35 Insert 15.1 shows the concentration of tourism businesses per super output area within a 15 km radius from the Project Site. Diss has the highest concentration of tourism related businesses (31-60) in the 15km radius of the Project Site. These consist of businesses such as restaurants, bars as well as recreational activities. Other areas to the south east, south west and north of the site have 1-5 tourism businesses. Most of the 15km radius has between 5-15 tourism related businesses. Tourism businesses are present in the area, but not at a large scale. Nearby areas outside the 15km radius such as Bury St Edmunds have much higher concentrations of tourism-related businesses.

Tourism Sensitivity

15.7.36 The tourism profile outlined above indicates that tourism is not a significant sector in the local area. Therefore, tourism is considered to be of low sensitivity to the proposed Project.

Community infrastructure audit

15.7.37 Within 5km of the Project Site there are a range of community infrastructure such as schools, libraries, care homes, hospitals, dentists, community centres and parks. This includes the following facilities as Shown on Figure 15.1.

Education

- 11 Nursery Schools
- 12 Primary Schools
- 2 Secondary Schools

Healthcare

- 7 care homes
- 1 Hospital
- 2 GP surgeries
- 3 Pharmacies

Emergency Services

- 2 police stations
- 2 fire stations

Transport

- 14 local bus routes
- 1 train station

Recreation and Arts

- 5 community centres/town halls
- 5 parks/community spaces
- 1 sports ground
- 2 libraries

Community Infrastructure Sensitivity

15.7.38 The community infrastructure audit above shows that all receptors serve local catchments and are therefore of low sensitivity.

15.8 Preliminary Assessment of Potential Impacts

Socio Economic

15.8.2 The proposed Project will deliver positive socio-economic impacts through:

- employment creation; and
- capital expenditure and workers spending in the local economy.

15.8.3 These effects, with the exception of decommissioning employment (negligible) have been assessed to be of minor positive significance (Table 15.14). No adverse socio-economic impacts or effects are identified through the assessment.

Table 15.14 - Socio-Economic Impact Significance

Development Effect	Magnitude	Sensitivity	Impact Significance	Likelihood
Power Generation Plant				
Construction FTEs	Minor positive	Low/ medium	Slight positive	Between 172-204 constructions workers between years 1 and 2 (376) equivalent to 38 FTES)
Operational FTEs	Minor positive	Low	Slight positive	Likely to be between 11-49 FTES
Decommissioning FTEs	Negligible positive	Low	Not significant	No information available. Assumed to be similar to construction
Construction, operating and decommissioning expenditure in the local economy	Minor positive	Low	Slight positive	Likely to be at least £500,000 p.a. for operational phase
Gas Connection Option 1				
Construction FTEs	Negligible positive	Low	Not significant	Connection corridor does not affect areas where business activity takes place. Site access unlikely to affect traffic movements related to other business operations
Maintenance FTEs	Negligible positive	Low	Not significant	No access restrictions envisaged.
Decommissioning FTEs	Negligible positive	Low	Not significant	As for construction

Construction, operating and decommissioning expenditure in the local economy	Negligible positive	Low	Not significant	Similar to Power Generation Plant
Gas Connection Option 2				
As above				
Electrical Connection and Electrical Connection Compound Option 1				
Construction FTEs	Negligible adverse	Low	Not significant	The Electrical Connection corridor crosses the A140 and the Norwich Old Road to the west of the site. As the main trunk road between Ipswich and Norwich, businesses may experience some delays during the construction period, although with the development of a traffic management plan these should be minimal.
Maintenance FTEs	Negligible positive	Low	Not significant	No access restrictions envisaged.
Decommissioning FTEs	Negligible neutral	Low	Not significant	Connection infrastructure would likely be left in place with no anticipated attendant impacts.
Construction, operating and decommissioning expenditure in the local economy	Negligible positive	Low	Not significant	Similar to Power Generation Plant
Electrical Connection and Electrical Connection Compound Option 2				
As above				

Tourism

15.8.4 The following types of impact associated with the proposed Project may potentially affect the local tourism economy as detailed in

15.8.5 Table 15.15 to Table 15.19 below.

Table 15.15 - Power Generation Plant Tourism Impact Significance

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
Visual	Minor	Low	Slight	There is already an existing stack at adjacent to the Project Site of greater height than the proposed Project. Therefore, the level of visual impact is considered to be minor as the visual impact of industrialisation has already been established. Moreover, the likelihood of significant impact reduces with distance. The majority of tourism related-businesses within 15km are located 5-10km away from the Project Site. The probability of the proposed Project significantly affecting tourism in terms of visual impact is considered low.
Noise	Minor	Low	Slight	Any noise impacts are expected to be restricted to the immediate area of the proposed Project Site. There is not a significant cluster of tourism-related activity in this area. Noise is not therefore expected to be a significant issue for tourism activity in the area.
Traffic/ Accessibility	Minor	Low	Slight	While there may be some occasional, temporary and short term delays on the local road network during the construction phase as a result of abnormal load movements, the implementation of an appropriate Traffic Management Plan should ensure that no tourism-related business is affected significantly.
Air Quality	Minor	Low	Slight	Any air quality impacts are expected to be restricted to the immediate local area around the Project Site. As stated above there is not a significant cluster of tourism-related activity around the Project Site. Therefore, air quality is not expected to be a significant issue for tourism in the area.

15.8.6 The following types of impact associated with the gas and electrical connections may potentially affect the local tourism economy:

Table 15.16 - Gas Connection Route Corridor Option 1 Tourism Impact Significance

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
Visual	Minor	Low	Slight	Visual impacts may only be experienced during the construction phase of the route corridor and are therefore temporary and not considered significant. Moreover, the route corridor will be located through farmland to the east of the A140 and not located close to any visitor attractions.
Noise	Minor	Low	Slight	Noise impacts may only be experienced during the construction phase and are therefore temporary and not considered significant. As stated above there are no tourism receptors located in close enough proximity to experience noise impacts.
Traffic/ Accessibility	Minor	Low	Slight	While occasional, temporary and short term delays on the A140 and other nearby roads may be possible during the construction phase as a result of abnormal load movements, the implementation of an appropriate Traffic Management Plan should ensure that no tourism-related business is affected significantly. The route corridor is designed to avoid particularly sensitive tourism and recreation locations. It route corridor runs through farmland and there are no known key promoted walking/cycling paths/routes running through the proposed route corridor. Therefore, no significant effects are expected. However, if any key routes were later highlighted as being affected, the contractors would ensure ongoing safe access and provide an alternative were any

				recreational routes temporarily closed due to construction activities, or where obstruction or diversions was required.

Table 15.17 - Gas Connection Route Corridor Option 2 Tourism Impact Significance

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
Visual	Minor	Low	Slight	As stated under Gas Connection Route Corridor 1, Table 15.23.
Noise	Minor	Low	Slight	As stated under Gas Connection Route Corridor 1, Table 15.23.
Traffic/ Accessibility	Minor	Low	Slight	As stated under Gas Connection Route Corridor 1, Table 15.23.

Table 15.18 -Electrical Connection Option 1 and Electrical Connection Compound Option 1Tourism Impact Significance

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
Visual	Moderate	Low	Low	There are already existing over head lines adjacent to the proposed Electrical Connection Compound area which are much taller than the proposed compound; however, the compound would be situated within a rural landscape. Therefore, the level of visual impact on tourism is considered to be moderate. Moreover, the likelihood of significant impact reduces with distance. The majority of tourism related-businesses within 15km are located 5-10km away from the proposed compound. The probability of the proposed compound significantly affecting tourism in terms of visual impact is considered low. The route corridor is located mainly on farmland west of the A140

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
				and not close to any visitor attractions
Noise	Minor	Low	Slight	As noise impacts will mostly be limited to the construction phase, they would be temporary and not considered significant. During operation, there is potential for electrical 'hum' to be audible within close proximity of the compound, however, stated above there are no tourism receptors sufficiently close to experience noise impacts
Traffic/ Accessibility	Minor	Low	Slight	The Electrical Connection Option 1 crosses the A140 and the Old Road to Norwich to the west of the Power Generation Plant site. As the main trunk road between Ipswich and Norwich, visitors may experience some delays during the construction period, although with the development of a traffic management plan these should be minimal. During operation, traffic movements to the electrical connection compound will be minimal and there are no anticipated impacts at this preliminary stage.

Table 15.19 - Electrical Connection Option 2 and Electrical Connection Compound Option 2 Tourism Impact Significance

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
Visual	Minor	Low	Slight	As stated under Electrical Connection Route Corridor 1, Table 15.25.
Noise	Minor	Low	Slight	As stated under Electrical Connection Route Corridor 1, Table 15.25. While a pub in Yaxley is close to the proposed route corridor, it is sufficiently distant so as to not experience adverse impacts.
Traffic/ Accessibility	Minor	Low	Slight	As stated under Electrical Connection Route Corridor 1, Table 15.25. It is not envisaged that access to the pub in Yaxley would be affected. No significant effects are expected.

Community Infrastructure

15.8.7 The following impacts associated with the proposed Project may be experienced by local community infrastructure facilities/receptors:

Table 15.20 - Community Infrastructure Impact Significance

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
Visual	Minor	Low	Slight	It is considered unlikely that the operation or effectiveness of community facilities would be affected by the appearance of the proposed Project. Patronage of recreation based community facilities is primarily driven by demand for the activity they host. As long as services or facilities can be provided from the receptor the visual appearance of the development should not affect levels of patronage or its operation.
Noise	Minor	Low	Slight	Any noise impacts are expected to be restricted to the immediate area of the Power Generation Plant site.. There is not a significant cluster of community facilities in this area. Noise is not therefore expected to be a significant issue for tourism activity in the area.
Traffic/ Accessibility	Minor	Low	Slight	Whilst there may be some occasional, temporary and short term delays on the local road network during the construction phase as a result of abnormal load movements, the implementation of an appropriate Traffic Management Plan should ensure that no community facilities are significantly affected.
Air Quality	Minor	Low	Slight	Any air quality impacts are expected to be restricted to the immediate local area around the Project site. As stated above there are no community facilities situated within the proposed development site. Therefore, air quality is not expected to be a significant issue for community facilities in the area.

15.8.8 The following impacts associated with the gas and electrical connections may be experienced by local community infrastructure facilities/receptors:

Table 15.21 - Gas Connection Route Corridor Option 1 Community Infrastructure Impact Significance

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
Visual	Minor	Low	Slight	Visual impacts may only be experienced during the construction phase of the route corridor and are therefore temporary and not considered significant. Moreover, the route corridor will be located through farmland to the east of the A140 and not located close to any community infrastructure.
Noise	Minor	Low	Slight	Noise impacts may only be experienced during the construction phase and are therefore temporary and not considered significant. As stated above there are no community infrastructure located in close enough proximity to experience noise impacts.
Traffic/ Accessibility	Minor	Low	Slight	While occasional, temporary and short term delays on the A140 and other nearby roads may be possible during the construction phase as a result of abnormal load movements, the implementation of an appropriate Traffic Management Plan should ensure that no community facility is affected significantly.

Table 15.22 - Gas Connection Route Corridor Option 2 Community Infrastructure Impact Significance

Potential Impact	Magnitude	Sensitivity	Impact Significance	Likelihood of Effect
Visual	Minor	Low	Slight	As stated under Gas Connection Route Corridor 1, Table 15.28
Noise	Minor	Low	Slight	As stated under Gas Connection Route Corridor 1, Table 15.28
Traffic/ Accessibility	Minor	Low	Slight	As stated under Gas Connection Route Corridor 1, Table 15.28

15.9 Potential Mitigation / Management Techniques

15.9.1 As no significant adverse socio-economic, tourism and recreation and community infrastructure effects have been identified during this initial assessment, there is no requirement for any mitigation measures at this stage.

15.10 Preliminary Assessment of Residual Effects

15.10.1 On the basis of the preliminary environmental information and assessment described above there are not predicted to be likely significant effects on socio-economics, tourism and recreation and community infrastructure as a result of the proposed Project.

15.11 Next Steps

15.11.1 Building from this initial assessment the following steps will be undertaken in the next phase of socio-economic analysis:

- A mapping of the ZTV analysis against tourism and recreational receptors in the area to gain a better understanding of the potential visual impact of the assessment;
- The impact assessment will be informed in part by a Business Survey, which will ask local tourism-related businesses in the area what impact the proposed Project and associated gas and electrical connections will have on their business and on tourism in the wider area.
- Detailed estimates of the economic impact of the construction and operation of Project and the construction of the gas and electricity components.
- An impact assessment of the community facilities

SECTION 16

CUMULATIVE IMPACT

16 CUMULATIVE IMPACT

16.1 Introduction

16.1.1 This section provides a preliminary assessment of the potential cumulative impacts associated with the proposed Project based on the current understanding of the proposed Project and its surroundings. It draws on the assessment of impacts provided in sections 6 to 15, along with information relating to other developments in the area, either existing or proposed.

16.1.2 A more detailed assessment of these impacts will be provided in the ES that accompanies the proposed DCO Application.

16.1.3 Cumulative impacts can be either:

- Type 1 Cumulative Impacts

  These are combined effects of different types of impact on a single receptor. For example: dust, noise and visual impacts resulting from construction and operation of the proposed Project and other reasonably foreseeable future developments; or

- Type 2 Cumulative Impacts

  These are the same type of impact from the proposed project and current or reasonably foreseeable future developments which may individually be insignificant, but could be cumulatively significant. For example: cumulative traffic impacts during construction.

16.1.4 This section presents the current and reasonably foreseeable future developments considered as part of this preliminary cumulative impact assessment are listed and described in Table 16.1

16.1.5 For the purposes of this assessment, reasonably foreseeable future developments have been defined as those which

- are consented but not yet built;
- are not yet consented but in the planning system; and
- are committed to come forward (i.e. supported in a development plan)

Table 16.1- Description of Developments Considered in the preliminary Cumulative Impact Assessment

Name of Development	Status	Description of Development
Diss Compressor Station	Operational	Large gas compressor station situated on Eye Airfield adjacent to the proposed Power Generation Plant site. The site regulates the pressure of natural gas being transported through the NTS.
Chicken Litter Power Station	Operational	The Eye Power Station is owned by the Fibrowatt Group. It is a 12.7 MW Power Station which generates electricity through the combustion of poultry litter. The plant first became operational in July 1992.
Eye Airfield Wind Turbines	Operational	Winddirect / Roy Humphrey Group own two 2.5 MW Nordex N100 turbines on the land within the former Eye Airfield.
Eye Wind Power Ltd	Consented	Two 3.4 MW 130m tall turbines consented but not yet built on land to the east of the former Eye Airfield landing strip.
Industrial development within the former Eye Airfield	Operational	Various industrial businesses across a number of industrial estates including Road Haulage, Manufacturing and Warehousing
National Grid Electrical Transmission System	Operational	Existing 400 kV overhead line located 1 km west of the former Eye Airfield.

16.1.6 The potential for cumulative impacts with these developments during construction / decommissioning of the proposed Project is provided in Table 16.2. The potential for cumulative impacts with these developments during operation of the proposed Project is provided in Table 16.3.

Table 16.2 - Potential Cumulative Impacts during Construction and Decommissioning of the proposed Project

Impact Section	Diss Compressor Station	Chicken Litter Power Station	Eye Airfield Wind Turbines	Eye Wind Power Ltd	Industrial development within the former Eye Airfield	National Grid Electrical Transmission System
Air Quality	×	×	×	√	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	Although the construction of proposed Project has the potential to add to emissions from existing industrial activities, including the Diss Compressor Station and Chicken Litter Power Station, these activities will be considered as part of the normal impact assessment process given that the operational developments will form part of the baseline upon which construction emissions would be assessed are already captured in the baseline assessment and are thus not considered cumulative. As such the only potential cumulative impact on air quality is the construction of the Eye Wind Power Ltd turbines, which would likely also generate dust and traffic emissions.					
Noise and Vibration	√	√	√	√	√	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	Cumulative impacts may arise due to: Noise and vibration generating equipment / plant which is used during the construction the proposed Project; together with, noise and vibration emissions from nearby operation within the former Eye Airfield, including the wind turbines, Chicken Litter Power Station and other industrial estate activities. Although these existing noise sources are already captured in the baseline, it is important to consider the addition to these sources to ensure that 'Noise Creep', where there is a gradual increase in background noise over time, is not permitted to occur.					
Ecology	×	×	×	×	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	No cumulative impacts on ecology have been identified. Although emissions during construction could add to those already produced during the constructing of the wind turbines, even in the unlikely event that these two projects were built in parallel, there would not be expected to have any negative impact on any ecologically designated sites.					
Water Quality and Resources	×	×	×	×	×	×

Impact Section	Diss Compressor Station	Chicken Litter Power Station	Eye Airfield Wind Turbines	Eye Wind Power Ltd	Industrial development within the former Eye Airfield	National Grid Electrical Transmission System
Description, Proposed Mitigation and Likely Residual Cumulative Impact	Although a number of potential impacts on water quality have been identified for the proposed Project, depending upon the choice of the Electrical Connection Compound and Electrical Connection, no other impacts from other activates have been identified that would result in a cumulative effect.					
Geology, Ground Contamination and Agriculture	×	×	×	√	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	As the main impact on Geology, Ground Contamination and Agriculture from the construction of the proposed Project would be the sterilisation of Agricultural Land, the only cumulative impact would be an increased loss of agricultural land in the area following the construction of the consented turbines, which would also result in temporary sterilisation.					
Landscape and Visual Impacts	√	√	√	√	√	√
Description, Proposed Mitigation and Likely Residual Cumulative Impact	It is possible that the proposed Project could have some level of cumulative impact in respect to Landscape and Visual impact, particularly in association with the new and consented wind turbines. Although all but the Eye Wind Power turbines are existing developments, it is important to consider these existing features in the cumulative assessment to reduce the potential for 'Landscape Saturation'. Further details of this potential impact will be understood once the LIV assessment has been undertaken.					
Waste Management and Health	×	×	×	√	×	×

Impact Section	Diss Compressor Station	Chicken Litter Power Station	Eye Airfield Wind Turbines	Eye Wind Power Ltd	Industrial development within the former Eye Airfield	National Grid Electrical Transmission System
Description, Proposed Mitigation and Likely Residual Cumulative Impact	Along with the construction of the proposed Project, none of the identified developments are considered likely to result in any negative impacts on human health. Although the proposed Project will produce waste, the waste from the other developments is included in the baseline assessment. The only potential cumulative impact on from waste would be associated with the construction of the Eye Wind Power turbines, with would likely be minimal.					
Traffic, Transport and Access	×	×	×	√	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	Cumulative impacts could arise if the consented turbines were constructed at the same time as the proposed Project, however, as that development has already been consented, the likelihood of the two developments being constructed in parallel is minimal and steps would be taken to ensure that that does not happen.					
Archaeology and Cultural Heritage	√	√	√	√	√	√
Description, Proposed Mitigation and Likely Residual Cumulative Impact	None of the identified developments are considered likely to impact upon buried archaeology; however, it is possible that there could be a cumulative impact on the setting of cultural heritage impacts if the construction activities are visible, in addition to one of the other large structures associated with these developments. This effect is similar to Landscape Saturation' as described above.					

Table 16.3 - Potential Cumulative Impacts during Operation of the proposed Project

Impact Section	Diss Compressor Station	Chicken Litter Power Station	Eye Airfield Wind Turbines	Eye Wind Power Ltd	Industrial development within the former Eye Airfield	National Grid Electrical Transmission System
Air Quality	×	×	×	×	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	None of the identified developments are considered to contribute to cumulative impacts in respect to Air Quality during operation. The primary reason for this is that all developments excluding the Eye Wind Power turbines are included in the baseline assessment, and once constructed, these turbines will not produce any emissions.					
Noise and Vibration	√	√	√	√	√	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	The cumulative impacts on operational Noise and Vibration are considered to be similar to those described above during construction and decommissioning.					
Ecology	√	√	×	×	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	The cumulative impacts on Ecology during operation are considered to be similar to those described above during construction and decommissioning					
Water Quality and Resources	×	×	×	×	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	The cumulative impacts on Water Quality and Resources during operation are considered to be similar to those described above during construction and decommissioning					

Impact Section	Diss Compressor Station	Chicken Litter Power Station	Eye Airfield Wind Turbines	Eye Wind Power Ltd	Industrial development within the former Eye Airfield	National Grid Electrical Transmission System
Geology, Ground Contamination and Agriculture	×	×	×	√	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	The cumulative impacts on Geology, Ground Contamination and Agriculture during operation are considered to be similar to those described above during construction and decommissioning.					
Landscape and Visual Impacts	√	√	√	√	√	√
Description, Proposed Mitigation and Likely Residual Cumulative Impact	It is possible that the proposed Project could have some level of cumulative impact in respect to Landscape and Visual impact, particularly in association with the new and consented wind turbines and the stack of the Chicken Litter Power Station. Further details of this potential impact will be understood once the Landscape and Visual Impact Assessment has been undertaken and care will be taken to consider the potential for 'Landscape Saturation'.					
Waste Management and Health	×	×	×	×	×	×
Description, Proposed Mitigation and Likely Residual Cumulative Impact	The cumulative impacts on Waste Management and Health during operation are considered to be similar to those described above during construction and decommissioning.					
Traffic, Transport and Access	×	×	×	×	×	×

Impact Section	Diss Compressor Station	Chicken Litter Power Station	Eye Airfield Wind Turbines	Eye Wind Power Ltd	Industrial development within the former Eye Airfield	National Grid Electrical Transmission System
Description, Proposed Mitigation and Likely Residual Cumulative Impact	The only development that could potentially result in a cumulative impact on traffic is the Eye Wind Power turbines. However, once constructed, they will be relatively self sufficient and any scheduled maintenance visits would have a negligible impact on local traffic flows.					
Archaeology and Cultural Heritage	√	√	√	√	√	√
Description, Proposed Mitigation and Likely Residual Cumulative Impact	The cumulative impacts on Archaeology and Cultural Heritage during operation are considered to be similar to those described above during construction and decommissioning.					