FRANCE-ALDERNEY-BRITAIN (FAB) LINK INTERCONNECTOR:

UK Converter Station Environmental Report Volume 1 - Text

December 2016

On behalf of FAB Link Ltd

Our Ref: OXF 7729

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### Definition of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>‘Proposed development’</td>
<td>The development of the HVDC converter station at land at to the east of Exeter Airport, for which a planning application will be made to East Devon District Council.</td>
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<tr>
<td>‘Project’</td>
<td>The FAB Link Interconnector Project in its entirety, including all onshore and offshore works in the UK, Alderney and France.</td>
</tr>
<tr>
<td>‘Cable route’</td>
<td>The footprint of the temporary land take for the installation of the interconnector cable.</td>
</tr>
<tr>
<td>‘Easement’</td>
<td>The permanent 12 metre land take required for the cable to service the cable.</td>
</tr>
<tr>
<td>‘Application site’</td>
<td>The area encircled by a red line on the location plan for which planning permission will be sought.</td>
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## Glossary

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<tr>
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<th>Description</th>
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<tr>
<td>AADT:</td>
<td>Annual Average Daily Traffic</td>
</tr>
<tr>
<td>AIL:</td>
<td>Abnormal Indivisible Load</td>
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<tr>
<td>ALC:</td>
<td>Agricultural Land Classification</td>
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<tr>
<td>AOD:</td>
<td>Above Ordnance Datum</td>
</tr>
<tr>
<td>AONB:</td>
<td>Area of Outstanding Natural Beauty</td>
</tr>
<tr>
<td>AQMA:</td>
<td>Air Quality Management Area</td>
</tr>
<tr>
<td>ARE:</td>
<td>Alderney Renewable Energy Ltd</td>
</tr>
<tr>
<td>AURN:</td>
<td>Automatic Urban and Rural Network</td>
</tr>
<tr>
<td>BAP:</td>
<td>Biodiversity Action Plan</td>
</tr>
<tr>
<td>BGS:</td>
<td>British Geological Survey</td>
</tr>
<tr>
<td>BPM:</td>
<td>Best Practicable Means</td>
</tr>
<tr>
<td>Bq m⁻³</td>
<td>Becquerels per cubic metre</td>
</tr>
<tr>
<td>BS:</td>
<td>British Standard</td>
</tr>
<tr>
<td>BSI:</td>
<td>British Standard Institution</td>
</tr>
<tr>
<td>CEH:</td>
<td>Centre for Ecology and Hydrology</td>
</tr>
<tr>
<td>CEMP:</td>
<td>Construction Environmental Management Plan</td>
</tr>
<tr>
<td>CFMP:</td>
<td>Catchment Flood Management Plan</td>
</tr>
<tr>
<td>CHSR:</td>
<td>Conservation of Habitats and Species Regulations</td>
</tr>
<tr>
<td>CIEEM:</td>
<td>Chartered Institute for Ecology and Environmental Management</td>
</tr>
<tr>
<td>CMS:</td>
<td>Construction Management System</td>
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<tr>
<td>CoCP:</td>
<td>Code of Construction Practice</td>
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<tr>
<td>CSM:</td>
<td>Conceptual Site Model</td>
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<tr>
<td>CRoW:</td>
<td>Countryside and Rights of Way Act</td>
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<td>CWS:</td>
<td>County Wildlife Site</td>
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<tr>
<td>dBA:</td>
<td>A-weighted decibel</td>
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<tr>
<td>DBRC:</td>
<td>Devon Biodiversity Records Centre</td>
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<td>DBG:</td>
<td>Devon Bat Group</td>
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<tr>
<td>DCC:</td>
<td>Devon County Council</td>
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<tr>
<td>DCLG:</td>
<td>Department for Communities and Local Government</td>
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<td>DECC:</td>
<td>Department for Energy and Climate Change</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>Defra</td>
<td>Department for Environment, Food and Rural Affairs</td>
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<td>DMP</td>
<td>Dust Management Plan</td>
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<td>DMRB</td>
<td>Design Manual for Roads and Bridges</td>
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<td>DTS</td>
<td>Desk Top Study</td>
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<tr>
<td>DWT</td>
<td>Devon Wildlife Trust</td>
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<td>EA</td>
<td>Environment Agency</td>
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<td>EDDC</td>
<td>East Devon District Council</td>
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<td>EDLP</td>
<td>East Devon Local Plan</td>
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<td>EHO</td>
<td>Environmental Health Officer</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EMF</td>
<td>Electric and Magnetic Fields</td>
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<td>EPUK</td>
<td>Environmental Protection UK</td>
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<td>ES</td>
<td>Environmental Statement</td>
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<td>FAB</td>
<td>France-Alderney-Britain</td>
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<td>FRA</td>
<td>Flood Risk Assessment</td>
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<td>GLVIA</td>
<td>Guidelines for Landscape and Visual Impact Assessment</td>
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<tr>
<td>GPDO</td>
<td>Town and Country Planning (General Permitted Development) (England) Order 2015</td>
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<tr>
<td>Ha</td>
<td>Hectare</td>
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<tr>
<td>HDV</td>
<td>Heavy Duty Vehicle</td>
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<td>HER</td>
<td>Historic Environment Record</td>
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<td>HGV</td>
<td>Heavy Goods Vehicle</td>
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<td>HLC</td>
<td>Historic Landscape Characterisation</td>
</tr>
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<td>HR</td>
<td>Hedgerows Regulations</td>
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<tr>
<td>HSI</td>
<td>Habitat Suitability Index</td>
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<tr>
<td>HVAC</td>
<td>High Voltage Alternating Current</td>
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<tr>
<td>HVDC</td>
<td>High Voltage Direct Current</td>
</tr>
<tr>
<td>IAQM</td>
<td>Institute of Air Quality Management</td>
</tr>
<tr>
<td>LA</td>
<td>Local Authority</td>
</tr>
<tr>
<td>LCA</td>
<td>Landscape Character Area</td>
</tr>
<tr>
<td>LCT</td>
<td>Landscape Character Type</td>
</tr>
<tr>
<td>LDV</td>
<td>Light Duty Vehicle</td>
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</tbody>
</table>
LLFA: Lead Local Flood Authority
LOAEL: Lowest Observed Adverse Effect Level
LNR: Local Nature Reserve
MAFF: Ministry of Agriculture, Fisheries and Food
MAGIC: Multi-Agency Geographic Information for the Countryside
Mg/l: Milligrams per litre
MMO: Marine Management Organisation
MW: Megawatt
NCA: National Character Area
NETS: National Electricity Transmission System
NERC: Natural Environment and Rural Communities Act
NJUG: National Joint Utilities Group
NNR: National Nature Reserve
NO₂: Nitrogen dioxide
NOEL: No Observed Adverse Effect Level
NPPF: National Planning Policy Framework
NPPG: National Planning Practice Guidance
NPS: National Policy Statement
NPSE: Noise Policy Statement for England
NSIP: Nationally Significant Infrastructure Project
NSR: Noise Sensitive Receptor
NTS: Non-Technical Summary
NVZ: Nitrate Vulnerable Zone
Ofgem: The Office of Gas and Electricity Markets
OFTO: Offshore Transmission Operator
OS: Ordnance Survey
OSD: Ordnance Survey Drawing
OSWI: Other Site of Wildlife Interest
PBA: Protection of Badgers Act
PCI: Project of Common Interest
PM₁₀: Particulate matter with a mean aerodynamic diameter up to 10 µm
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>PPG-N</td>
<td>Planning Practice Guidance on Noise</td>
<td>Planning Practice Guidance on Noise</td>
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<tr>
<td>PRA</td>
<td>Preliminary Risk Assessment</td>
<td>Preliminary Risk Assessment</td>
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<tr>
<td>PRoW</td>
<td>Public Right of Way</td>
<td>Public Right of Way</td>
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<tr>
<td>RSPB</td>
<td>Royal Society for the Protection of Birds</td>
<td>Royal Society for the Protection of Birds</td>
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<tr>
<td>RTE</td>
<td>Réseau de Transport d'Électricité</td>
<td>Réseau de Transport d'Électricité</td>
</tr>
<tr>
<td>SAC</td>
<td>Special Conservation Area</td>
<td>Special Conservation Area</td>
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<tr>
<td>SFRA</td>
<td>Strategic Flood Risk Assessment</td>
<td>Strategic Flood Risk Assessment</td>
</tr>
<tr>
<td>SGT</td>
<td>Super Grid Transformers</td>
<td>Super Grid Transformers</td>
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<tr>
<td>SLM</td>
<td>Sound Level Meters</td>
<td>Sound Level Meters</td>
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<tr>
<td>SOAEL</td>
<td>Significant Observed Adverse Effect Level</td>
<td>Significant Observed Adverse Effect Level</td>
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<tr>
<td>SPA</td>
<td>Special Protection Area</td>
<td>Special Protection Area</td>
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<tr>
<td>SPZ</td>
<td>Source Protection Zone</td>
<td>Source Protection Zone</td>
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<tr>
<td>SSSI</td>
<td>Site of Special Scientific Interest</td>
<td>Site of Special Scientific Interest</td>
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<tr>
<td>SuDS</td>
<td>Sustainable Drainage Systems</td>
<td>Sustainable Drainage Systems</td>
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<tr>
<td>TEN-E</td>
<td>Trans-European energy networks</td>
<td>Trans-European energy networks</td>
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<td>UK BAP</td>
<td>United Kingdom Biodiversity Action Plan</td>
<td>United Kingdom Biodiversity Action Plan</td>
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<tr>
<td>UWS</td>
<td>Unconfirmed Wildlife Site</td>
<td>Unconfirmed Wildlife Site</td>
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<tr>
<td>UXO</td>
<td>Unexploded Ordnance</td>
<td>Unexploded Ordnance</td>
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<tr>
<td>VCR</td>
<td>Valve Cooling Radiators</td>
<td>Valve Cooling Radiators</td>
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<tr>
<td>VSC</td>
<td>Voltage Source Converter</td>
<td>Voltage Source Converter</td>
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<td>WCA</td>
<td>Wildlife and Countryside Act</td>
<td>Wildlife and Countryside Act</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
<td>World Health Organisation</td>
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<tr>
<td>ZTV</td>
<td>Zone of Theoretical Visibility</td>
<td>Zone of Theoretical Visibility</td>
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1 Introduction

Purpose of This Document

1.1 This Environmental Report has been prepared by RPS on behalf of FAB Link Ltd (the Applicant). The findings of this Environmental Report support an outline planning application to East Devon District Council (EDDC) for the construction and operation of a converter station on land to the east of Exeter Airport in association with the FAB Link Interconnector.

Introduction to the FAB Link Interconnector

1.2 FAB Link is a proposed interconnector which will allow the exchange and trading of up to 1400MW of electricity between France, Alderney and Britain. The cable will cross the channel island of Alderney in order to connect future renewable tidal stream generation in the seas around Alderney.

1.3 The main components of the FAB Link Interconnector are shown on Figure 1.1 and comprise:

- High Voltage Direct Current (HVDC) electricity cables buried in or placed (and protected) upon the sea bed between the Contentin (or Cherbourg) Peninsula, Normandy, France and the South Devon coast of Britain – the Offshore Cable Route;
- HVDC electricity cable landing and traverse (as underground cables) of the Channel Island of Alderney;
- HVDC onshore and offshore cable ‘transitions’ at the shorelines of all three territories;
- HVDC to High Voltage Alternating Current (HVAC) converter stations in both Normandy and Devon; and
- HVDC onshore cables from the transition points to the converter stations and HVAC onshore cables from the converter stations to substations in both territories — the Onshore Cable Route.
- Connection to the electricity system in Great Britain via the high voltage National Electricity Transmission System (NETS) substation near Exeter, operated by National Grid Electricity Transmission (‘National Grid’).

1.4 The FAB Link Interconnector is designated as a Project of Common Interest (PCI) under the Connecting Europe Facility and has received financial support for its development under that programme. It has been granted an Interconnector Licence by the Gas and Electricity Markets Authority and has been granted Interim Project Approval under the interconnector “cap and floor” regime by The Office of Gas and Electricity Markets (Ofgem).

1.5 FAB Link Ltd is developing the applications for the UK onshore, UK offshore and Alderney elements of the FAB Link Interconnector (as shown on Figure 1.1).
Selection of the HVDC Converter Station Site

1.6 The selection of the connection point to the UK National Grid is described in the UK Connection Point Selection Report (Transmission Investment, 2016).

1.7 Factors such as land availability, proximity to the NGET substation, access, planning and environmental constraints led to the selection of the preferred converter station site near to Exeter Airport in 2015, which overall was determined to be most consistent with the project’s efficiency and cost requirements. The detail of the selection process is provided in the HVDC Converter Station Site Selection Process Report (RPS, 2015).

Statutory Framework and Planning Approach

EIA Screening

1.8 Electricity infrastructure projects that are classed as nationally significant infrastructure projects (NSIPs) under Sections 14 to 16 of the Planning Act 2008 may require EIA under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009. The Department for Energy and Climate Change (DECC) also continues to administer some electricity infrastructure consents under Sections 36 and 37 of the Electricity Act 1989 where a requirement for EIA may arise under the Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000 (as amended).

1.9 In the case of the onshore cable route and converter station for an interconnector such as FAB Link, the requirements for development and/or planning consent do not fall under the Planning Act 2008 or the Electricity Act 1989. As confirmed by the UK Government (DECC, 2014), the relevant legislation for planning is the Town and Country Planning Act 1990 (T&CPA) and any requirements for EIA are those arising under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (as amended) (referred to hereafter as ‘the EIA Regulations’).

1.10 An EIA Screening Report for the development of a converter station was issued to EDDC in December 2015 (Appendix 1.1). This proposed that the development of a converter station at land east of Exeter Airport did not require EIA on the basis that:

- It falls outside the definition of development within Schedule 1 of the EIA Regulations (i.e. where an EIA is mandatory); and
- Although, it potentially falls within development category 10 – Infrastructure Projects - within Schedule 2 of the EIA Regulations and might exceed the screening thresholds identified for categories 10(a) and 10 (b);
  - The development would not be likely to be result in any significant effects on the environment; and
  - The proposed converter station would not be located in a ‘sensitive area’ as defined in the EIA Regulations.
1.11 An EIA Screening Opinion was issued by EDDC in January 2016 (Appendix 1.2). This confirmed that there is no requirement for the proposed development to be subject of a formal Environmental Impact Assessment. Notwithstanding the Screening Opinion of EDDC, FAB Link Ltd has agreed with EDDC that this Environmental Report should be prepared and issued.

1.12 FAB Link Ltd is a licence holder under section 6 of the Electricity Act 1989. The company therefore has certain permitted development rights as described in the Town and Country Planning (General Permitted Development) (England) Order 2015 (GPDO). The proposed converter station falls broadly within the GPDO description of Schedule 2, Part 15, Class B – electricity undertakings which covers: “Development by statutory undertakers for the generation, transmission, distribution or supply of electricity for the purposes of their undertaking…”

1.13 However, the converter station would not be permitted development because the required buildings would not be on operational land and would exceed 15 m in height. As the converter station is not permitted development, planning permission is required.

### Assessment Methodology

1.14 Each of the environmental topic assessments has been undertaken in accordance with recognised industry guidance and national policy. Each topic chapter sets out the following:

- National policy context;
- Relevant guidance;
- Details of any consultation undertaken to date;
- Assessment methodologies adopted;
- Assessment of construction and operational phase impacts; and
- Recommended mitigation measures to help reduce impacts.

### Structure of the Environmental Report

1.15 The Environmental Report has been structured in order to allow relevant environmental information to be easily accessible. This volume of the Environmental Report (Volume 1) includes the main text of the Environmental Report. The description of the project is provided in Chapter 2. The remainder of Volume 1 contains topic by topic environmental information as shown in Table 1.1.

1.16 Figures and appendices to accompany the text of the Environmental Report are provided separately in Volumes 2 and 3. Volume 3 includes specialist reports providing relevant background and technical information.

1.17 The FAB Link Project Summary (available as a separate document) has been produced which provides an overview of the entire FAB Link Interconnector project and summarises impacts and proposed mitigation measures in non-technical language.
1.18 The scope of this Environmental Report is based on environmental topics that might be associated with a development of this nature and also the topics identified within the EIA Screening Opinion as required to be addressed by any planning application for the site.

1.19 On the basis of the guidance for Electric and Magnetic Fields (EMFs) from electricity infrastructure adopted in the UK and the published supporting evidence, the levels of EMFs from the proposed development would be well below the guideline public exposure reference levels set to protect health and have therefore not required addressing in the Environmental Report for the Converter Station.

**Table 1.1: Structure of the Environmental Report**

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<td>Chapter 10 Land Use Agriculture and Soils</td>
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<tr>
<td>Chapter 11 Draft Code of Construction Practice</td>
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<tr>
<td><strong>Volume 2: Figures</strong></td>
</tr>
<tr>
<td>Including all figures and drawings to accompany the text.</td>
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<tr>
<td><strong>Volume 3: Appendices</strong></td>
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<tr>
<td>Including specialist reports forming technical appendices to the main text.</td>
</tr>
</tbody>
</table>
The Applicant

1.20 The FAB Link Interconnector is being developed through an unincorporated joint venture between RTE (Réseau de Transport d'Électricité) of France and FAB Link Limited of Guernsey. RTE is the owner and operator of the French national electricity grid. FAB Link Limited is an incorporated joint venture between Transmission Investment LLP of the UK and Alderney Renewable Energy Ltd (ARE).

1.21 Transmission Investment LLP is an operator and maintainer of various offshore transmission assets under Offshore Transmission Operator (OFTO) arrangements for connection of wind farms in the North Sea. ARE is the developer of a proposed tidal power station to be constructed off the south-east coast of Alderney and designed to take advantage of the extreme tidal currents in that area.

1.22 FAB Link Limited (‘the Applicant’) will own the assets in Alderney and Britain and RTE will own the assets in France.

The Assessment Team

1.23 The Environmental Report and planning application to EDDC has been managed by RPS, taking into account information provided by the client team. RPS has provided the specialist topic assessments within this Environmental Report.

Further Information

1.24 This Environmental Report is provided in support of the submitted application file under Article 10 of the Trans-European Energy Networks (TEN-E) Regulation to the Marine Management Organisation (MMO).

1.25 Copies of this report and the planning application are available to view on the EDDC website at http://eastdevon.gov.uk/planning/

1.26 Paper copies of the reports, including the Project Summary, can be provided (cost on application) or an electronic copy (CD Rom) can be obtained for free by submitting a request via email to fab@transmissioninvestment.com or in writing to:

FAB Link,
17th Floor, 88 Wood Street,
London
EC2V 7DA.
References


2 Project Description

Introduction

2.1 The following section describes the site and its context, the proposed development and its construction methods. The information is a summary of the data and assumptions used in compiling this Environmental Report.

2.2 It should be noted that the application to be made to EDDC will be in outline because the final design of the converter station will not be known until the autumn of 2017 when a contractor has been appointed. Therefore, the information presented here is at a high level, generic (albeit based on real-world examples) and applicable to a range of design scenarios. Nevertheless, assumptions made on the project design envelope are considered to be a reasonable worst case.

2.3 The application will also contain a Design and Access Statement as required by planning practice guidance for major applications as defined in article 2 of the Town and Country Planning (Development Management Procedure (England) Order 2015. The Design and Access Statement will set out the design principles adopted for the project in a Design Code. The Design Code document will establish the minimum quality of design through a design framework which must be met by the appointed contractors.

2.4 Because the detailed design of the converter station will require later approval (as a reserved matters application) by EDDC, the Design Code is expected to facilitate consideration of the later application having already established a design framework with the council.

Converter Station Site and Context

2.5 The location selected for the UK converter station lies east of Exeter Airport Industrial Estate, near ‘the Antiques Complex’ south east of Exeter Airport accessed from the A30 via the B3184 airport link road and an unclassified road called Long Lane (sometimes also called Westcott Road) (see Figure 2.1 Converter Station Location Plan).

2.6 The site does not have EDDC local development plan allocations but does lie to the immediate east of land identified as the Southern Development Zone within the Exeter Airport Master Plan for its potential for both airport related development and other employment development (Exeter International Airport, 2009, 2011).

2.7 The proposed converter station site lies within a single arable field which is defined by low managed hedgerows that contain some large hedgerow trees. Topography within the site is relatively level, sloping down about 5 m from the south east corner to the northern boundary. The site and its adjacent land to the west is within the control of FAB Link Ltd (the blue line boundary) and is approx. 7.59 ha (see Figure 2.2 Converter Station Site). The Converter Station site is 5.09 ha and an area of construction laydown in a separate field to the west is likely to be approx. 2 ha. The remaining 0.5 ha allows a buffer to neighbouring properties and boundary vegetation. The overall application (red line) boundary is 5.1 ha which includes some small areas of third party land required along Long Lane for passing places. Other passing places are also required along Long Lane but can be accommodated within the highway boundary and as such
do not require planning permission under the T&CPA but will require an agreement under Section 278 of the Highways Act 1980. These areas are also shown for clarity as encompassed by a red dashed line.

2.8 The reasons for selecting the site are detailed in the HVDC Converter Station Site Selection Process Report (RPS, 2015) but can be briefly summarised as:

- Sufficient size and conducive topography and not designated, protected or environmentally sensitive in any other respect;

- Proximity to the NGET Exeter substation and en-route between it and the landfall search zone;

- Proximity to the A30 and other main transport routes;

- Site character suitability of the proposals with other nearby uses / development types;

- Availability of the land not already allocated for other development in the local plan and airport master plan; and

- Commercially acceptable to the project sponsors and landowners and not otherwise constrained by existing land agreements.

2.9 The site is not located within any statutory or non-statutory designation for landscape, ecology or historic environment. The East Devon Area of Outstanding Natural Beauty (AONB) is located approximately 3.5 km to the south east at its closest point.

2.10 The nearest residential properties are at the Antiques Complex to the west, Higher Southwood Farm beyond the field to the east and Lower Southwood, Woodhouse Farm further east again. Other properties are located south of the A30 on Marwood Lane. The Hampton by Hilton hotel is also accessed from Long Lane to the west.

2.11 There are no waterbodies or watercourses within the site boundary. There are several ponds and ditches in the wider area, the closest pond being approximately 85m to the east. The Environment Agency flood mapping identifies the site as lying within Flood Zone 1. The site is therefore at low risk of flooding or less than 1 in 1,000 (0.1%) annual probability.

2.12 The site does not lie within a Groundwater Source Protection Zone. The site is underlain by bedrock that forms a Secondary B aquifer (predominantly lower permeability layers that may store and yield limited amounts of groundwater).

2.13 Two Grade II listed buildings have been identified within 500 m of the site and a further three Grade II listed buildings are located within 1 km of the site. These are detailed below:

- Lower Southwood Cottage and Lower Southwood Farmhouse: Grade II listed building (farmhouse and adjoining cottage) approximately 380 m to the east of the site;
• Little Silver and the Nook – Grade II listed buildings located approximately 800 m to the northeast of the site; and

• Treasbeare Farmhouse – Grade II listed building located approximately 950 m to the northwest.

2.14 There is one Registered Park and Garden (Rockbeare Manor – Grade II) within 1 km of the site. This is located to the east of the site (east of Lower Southwood).

2.15 Historic records related to World War II show that activities extended beyond the current airport boundaries including surviving evidence along the southern boundary of the site, close to Long Lane, and also along the northern boundary.

2.16 The arable field is of low ecological value due to intensive management. The hedgerows to the field are generally heavily managed although some hedges contain mature standard trees

**The UK Converter Station**

2.17 The total area of the development site inclusive of landscaping (red line boundary) is 5.1 ha. The operational converter station compound is expected to be up to 3.6ha of which up to approximately 1.1 ha will be occupied by the converter station buildings. Previous examples of this type of development are shown in Appendix 2.1.

2.18 The converter station is likely to have two halls of up to 20 m in overall height and with an operational footprint of up to approximately 11,000 m² which will house the semi-conductor valves used to convert:

• DC current to AC current, a process called ‘inverting’; and

• AC current to DC current, a process called ‘rectifying’.

2.19 The valve halls will be served by a cooling system which dissipates heat via a water circulation system of pumps and fans to the outside air as well as building air-conditioning.

2.20 Similar to a conventional substation, the converter station site will have external plant and equipment in the form of 400kV transformers, switchgear and bus bars together with smaller buildings which will house control systems as well as facilities for maintenance staff.

2.21 There may be some noise generated from the operation of the converter station, emanating from the following sources:

• The converter halls that contain the Voltage Source Converter (VSC) system;

• Converter Transformers; and

• Cooling plant (fans and radiators) associated with the converter hall(s), the VSC system, Valve Cooling Radiators (VCRs) and the Converter Transformers.
2.22 Two new accesses will be created off Long Lane to allow incoming traffic to be separated from vehicles leaving the site. The inbound access junction will be designed in such a way as to avoid the need for vehicles to wait on Long Lane before being admitted. Additional passing places will be installed at intervals along Long Lane within the highway boundary between the site and the airport industrial estate to enable oncoming vehicles to pass each other safely. Only a small number of parking spaces would be provided on site for the operational staff as the operational staffing requirement is low (3 to 5 full time equivalents).

2.23 The site will be fenced and monitored with security cameras and lighting. The lighting will be designed to avoid illumination of areas beyond the operational site.

**UK Converter Station Site Parameters**

2.24 Table 2.1 below summarises the maximum parameters anticipated to be required for the UK converter station – the outline application. As stated above, these parameters cover a number of options used historically by converter station manufacturers.

<table>
<thead>
<tr>
<th>Converter Station Parameter</th>
<th>Maximum</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site area</td>
<td>5.09ha</td>
<td>Red line boundary</td>
</tr>
<tr>
<td>Operational Area</td>
<td>3.6ha</td>
<td>Levelled site area and access excluding landscaping</td>
</tr>
<tr>
<td>Height of converter hall buildings</td>
<td>20m</td>
<td>Above levelled site expected to be set to approx. 39.35m AOD</td>
</tr>
<tr>
<td>Operational area of buildings</td>
<td>1.1ha</td>
<td>Converter hall and control room buildings</td>
</tr>
<tr>
<td>Height of tallest element</td>
<td>30m</td>
<td>Lightning conductors</td>
</tr>
<tr>
<td>Number of accesses</td>
<td>2</td>
<td>Separate inward and outbound flows</td>
</tr>
</tbody>
</table>

**UK Converter Station Illustrative Layouts**

2.25 The outline planning permission will require later approval of details relating to the scale, layout and appearance of the converter station. Because of this, issues related to the position and size of buildings, access and landscaping will also be reserved for later approval. Two illustrative design options have been prepared to demonstrate how the various buildings and equipment may be arranged on the site. The options shown at Figures 2.3 and 2.4 are illustrative only and show the types of infrastructure required and some typical dimensions which have been extrapolated from the main HVDC technology types that might be provided. These alternative arrangements are further depicted in 3D model views at Figures 2.5 a & b and 2.6 a & b. Whilst the dimensions of each main design component are realistic (and relevant to a particular
contractor and their technology), it is unlikely that the maximum parameter would be reached in all cases.

2.26 The illustrative layouts demonstrate how in two different instances, the required facilities can be accommodated into the site whilst still providing sufficient space for landscape screening and access. The selected contractor's design to be submitted for reserved matters approval by EDDC in the autumn of 2017 is likely to be a variation on one of the illustrative layouts which have informed this environmental report.

2.27 A scheme of landscaping will be provided comprising of land shaping and woodland planting to soften the external appearance of the site. Landscaping is also to be reserved for later approval but it has been possible to demonstrate the concept in response to the illustrative layouts (see Figures 2.7 and 2.8).

2.28 The converter station has a design life of 40 years (until 2060). Based on UK Climate Projections, a 20% climate change allowance has been adopted for use in attenuation calculations (for a 1:100 rainfall event). The 3.6 ha operational area has been assumed to comprise 57% (c.2.05 ha) buildings or low permeable construction (hardstanding). A surface water drainage strategy has been developed to ensure that runoff from the completed development would not exceed existing rates.

**UK Converter Station Construction**

2.29 Construction of the converter station would be undertaken over a period of approximately 34 months or 2.8 years and would be commissioned in 2020/21. The construction activities are summarised below.

**Site preparation (lay down area)**

2.30 Establishing the construction site will involve stripping of topsoil from the laydown area and importation of aggregate for hardstandings. It will be necessary to create a secure perimeter and suitable access from the highway as well as temporary facilities e.g. site offices, storage areas, welfare facilities, utilities.

**Site levelling (converter station)**

2.31 The converter station will be constructed on a level site which will be ‘benched’ into the existing topography using a balanced cut and fill. Topsoil will be moved onto the landscaping areas with surplus topsoil stored for later re-use. A formation level will be created by importing granular sub-base material.

**Drainage works including storm and foul water drains and oil interceptor tanks, roads and parking areas**

2.32 Permanent utilities and drainage will be installed on the converter station site together with the internal road network and other areas of permanent hardstanding. Outdoor operational areas will receive a surface dressing of stone.
Groundworks for the buildings and outdoor switchgear areas

2.33 Building platforms and foundations of other equipment will be engineered prior to buildings construction.

Landscaping and screening

2.34 Profiling and stabilising the landscaped boundary will be ongoing in parallel with the other activities to enable the planting to establish as soon as possible.

Erection of buildings (the converter halls and support buildings) and their fit out

2.35 Construction of the buildings including the erection of the steel frames of the main converter halls and control buildings and their cladding will proceed immediately after the groundworks are complete. Fit out of the buildings will follow and run concurrently with installation of equipment.

Erection of outdoor switchgear, busbars and associated plant

2.36 High voltage equipment will also be installed in concert with the building fit out and equipment installation in preparation for the import of the large transformers.

Importation of transformers and converter station valve systems

2.37 Converter transformers will be brought to site from the nearest suitable port and will comprise Abnormal Indivisible Loads (AILs) as each transformer transport vehicle may be up to 5 m wide and over 200 tonnes gross weight. Highways England require hauliers of such movements to give prior notification to the relevant Highways Authority and the Police. The returning empty vehicles would not be AILs because they ‘close-up’ after unloading the transformers.

Testing and commissioning of the equipment

2.38 Several weeks of commissioning and testing will be undertaken during which time the laydown area will be demobilised and restored to its original condition.

Programme

2.39 A draft construction programme is presented below. The converter station construction activities are likely to take approx. 34 months or 2.8 years beginning in early 2018. The main periods encompassing the above activities are:

- Ground Works – 6 months
- Main Civil Works – 16 months
- Equipment Installation and testing – 10 months
- Reinstatement of lay down area – 2 months

2.40 Construction activities would usually be undertaken during normal working hours of 07:00 to 19:00 on weekdays and 07:30 to 13:00 on Saturdays. However, some operations may require
work to take place outside these times. For example, abnormal loads may be encouraged to travel overnight to avoid causing disruption to traffic.

**Vehicle movements**

2.41 The majority of vehicle trips would be generated during the site mobilisation, demobilisation, ground works and civil engineering works stages. An average of 40 two-way HGV movements per day during these periods has been assumed. During peak times, there would be a maximum of 85 two-way HGV movements per day. This has been assumed for approx. 6 months when the most intensive construction activities overlap.

**Controlling the effects of construction**

2.42 The principal contractor will be required to produce a Construction Environmental Management Plan (CEMP) detailing the commitments and responsibilities for safeguarding the environment during the construction phase. The CEMP is a detailed ‘living’ document which is used to plan, implement and monitor specific controls on construction related impacts to the environment. It often contains detailed method statements for various activities, assigns responsibilities for implementation and monitoring as well as review of the success of any corrective actions.

2.43 At the outline stage, it is not possible to fulfil the objectives of a CEMP as described above. However, a draft Code of Construction Practice (CoCP) has been produced at Chapter 11 in order to record the commitments to the environment already made in the design process up to application submission. The CoCP and other conditions imposed on the outline planning permission will inform the appointed contractor’s CEMP.

2.44 In addition to the CoCP and CEMP, other documents are required as part of the integrated Construction Management System (CMS). These include (but are not limited to):

- Traffic Management Plan
- Pollution Incident Control Plan
- Resource Efficiency Plan
- Site Waste Management Plan
- Stakeholder Communications Plan

2.45 The contractors are likely to also participate in the Considerate Constructors scheme or similar.

**Cumulative Schemes**

2.46 The developments identified for consideration in the assessment of potential cumulative effects are shown on Figure 2.9 and listed at Appendix 2.2. The principal developments can be summarised as follows:

- Cranbrook new community (both consented and proposed);
• Skypark business complex adjacent to the airport;
• Exeter Science Park adjacent to the M5 motorway;
• Exeter Gateway intermodal freight facility adjacent to the railway and Clyst Honiton bypass;
• Other new housing such as at Tithebarn Green east of the Science Park; and
• Large scale solar farm developments.

2.47 These developments are clustered along a corridor of land south of the railway line and north of the Airport/A30. The projects are mostly phased developments which are expected to continue being implemented throughout the construction phase of the converter station development.

2.48 The following sections of the Environmental Report have examined the potential for cumulative effects occurring as a consequence of these committed and proposed developments.
References


Exeter International Airport (2011) Addendum to the Airport Master Plan (Autumn 2011)

FAB Link Ltd (2016) FAB: France Alderney Britain Interconnector Project Description, May 2016. Revision 0.2 Draft

3 Ecology and Nature Conservation

Introduction

3.1 This chapter appraises the likelihood of ecological impacts of the proposed FAB Link HVDC converter station development near Exeter Airport. This chapter draws on relevant topic guidance and consultation to inform the appraisal and sets out the proposed measures to mitigate any potential adverse impacts.

3.2 This assessment considers the ecological receptors at the site and those recorded within 2 km of the site (5 km for particularly mobile species and statutorily designated sites for nature conservation).

Assessment Methodology

3.3 The assessment was carried out using the principles identified by the Chartered Institute of Ecology and Environmental Management (CIEEM) in Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (Second Edition) (CIEEM, 2016). The assessment complies with advice in BS42020 (BSI 2013).

3.4 The following key principles are set out in this guidance:

• **Avoidance:** Seek options that avoid harm to ecological features (for example by locating on an alternative site).

• **Mitigation:** Adverse effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example through a condition or planning obligation.

• **Compensation:** Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.

• **Enhancements:** Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

Policy and Guidance

3.5 The assessment takes into account the following legislation, policies and guidance:

• **Wildlife and Countryside Act 1981** (as amended) (WCA).

• **Countryside and Rights of Way Act 2000** (CRoW).

• **Natural Environment and Rural Communities Act 2006** (NERC).

• **Conservation of Habitats and Species Regulations 2012** (CHSR).

• **Protection of Badgers Act 1992** (PBA).
Consultation

3.6 Details of the consultation undertaken for the converter station are provided in Table 3.1 below.

Table 3.1: Consultation Responses Relevant to this Chapter

<table>
<thead>
<tr>
<th>Date</th>
<th>Consultee and Issues Raised</th>
<th>How/ Where Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd July 2015</td>
<td><strong>Natural England (Meeting)</strong></td>
<td>Current proposed location is the result of sieve mapping exercise and is set out in the HVDC Converter Station Site Selection Process Report (RPS, 2015)</td>
</tr>
<tr>
<td></td>
<td>• Natural England was given an overview of process of selecting onshore converter station and associated consultation with East Devon District Council (EDDC).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• FAB Link Ltd stated intention to select converter station site of approximately 5 hectares by end of July, followed thereafter by request for formal pre-application consultation with East Devon District Council.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RPS noted that Natural England were not consulted on previous advice from EDDC, however Natural England may be asked to input to EDDC at the point of screening opinion request at end of 2015.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Natural England noted that sieve mapping exercise had screened out proximity to nature conservation sites, however Natural England would provide standard advice for ecology surveys that may be required for preferred converter station site.</td>
<td></td>
</tr>
<tr>
<td>28th September 2015</td>
<td><strong>Natural England (Meeting)</strong></td>
<td>Nature conservation value of the site is addressed in this chapter.</td>
</tr>
<tr>
<td></td>
<td>• From information available, Natural England considered it unlikely that there would be particular conservation interest on the site, subject to the outcome of the Phase 1 survey.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If there were particular features of interest, Natural England wished to be contacted to discuss further. Otherwise, they were content to wait until further consultation as part of the pre-application/EIA screening process later in the year.</td>
<td></td>
</tr>
<tr>
<td>28th September 2015</td>
<td><strong>Devon Wildlife Trust (DWT)(Meeting)</strong></td>
<td>Comments on suitability of</td>
</tr>
<tr>
<td></td>
<td>• DWT noted that hedges may be suitable for dormice and bat flight lines and also</td>
<td></td>
</tr>
</tbody>
</table>
Recommended that roofing of converter station should not be seeded (e.g. sedum mat) as this could attract birds such as breeding seagulls, which in turn would be an issue with respect to proximity to Exeter Airport.
- DWT noted that converter station should have appropriate lighting regime to ensure no impact on flight lines for birds.
- DWT noted that DBRC can provide data on an annual update basis. DWT also noted unconfirmed sightings should be taken into consideration.

### 5th November 2015

### RSPB (Meeting)
- FAB Link Ltd noted that the design and location of the converter station has been discussed with Exeter Airport in so far as the roof of any buildings should not be designed to attract birds. RSPB noted that the biggest concern to the airport is the population of birds in the Exe Estuary.

### 22nd January 2016

### East Devon District Council (Letter)
- Screening Opinion confirmed that the development does not require an Environmental Impact Assessment (EIA) but that an Ecology and Tree Survey should support the planning application.

### 2nd September 2016

### Devon County Council (letter)
- Requirement for direct and indirect impacts on statutory and non-statutory designated sites, European and other protected species, priority species and habitats to be considered and demonstrate how the proposals are compliant with relevant legislation and policy.
- Demonstration of avoidance, mitigation, enhancement or compensation measures required to address these impacts.
- Report needs to follow guidance for EIAs/surveys/mitigation, such as CIEEM Guidelines for development of Ecological Impact Assessments and BS42020.

### Methodology

#### 3.7 The assessment used the following material to establish the ecological baseline at the site:

- FAB Link Interconnector HVDC Converter Station Ecology Appraisal (December 2015).

This included desk study with a study area of 2 km radius around the site, extending to 5 km radius for statutorily designated sites and individual records of bats. Data from Devon Biological Records Centre (DBRC), Devon Bat Group (DBG) and the MAGIC interactive map Website ([www.magic.gov.uk](http://www.magic.gov.uk)) were used to identify relevant data. It also included an extended Phase 1 habitat survey of the site and its immediate surroundings (available at Appendix 3.1).
• FAB Link Interconnector: Habitat Suitability Index (HSI) Survey of Ponds Near Exeter Airport (December 2015) (Appendix 3.2).

• FAB Link Interconnector. HVDC Converter Station Ecology Great Crested Newt Survey (May 2016) (Appendix 3.3).

• FAB Link Interconnector. HVDC Converter Station Ecology Bat Roost Appraisal (March 2016) (Appendix 3.4).

• FAB Link Interconnector. HVDC Converter Station Ecology Bat Activity Survey (December 2016) (Appendix 3.5).

3.8 Information from the above sources was used to determine the importance of the ecological resources at the proposed site. This was done based on a hierarchical approach, considering statutorily designated sites, such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs), National and Local Nature Reserves (NNRs and LNRs) as of highest priority, followed by locally-designated sites, such as County Wildlife Sites (CWS), Other Sites of Wildlife Interest (OSWI) and Unconfirmed Wildlife Sites (UWS). This was followed by considering individual habitats, features or species against their protected status in legislation, or any other indication of importance, such as appearing in national or local biodiversity action plans.

3.9 Only those receptors determined to be important were considered in the assessment. Important receptors were identified as:

• any statutorily designated site (SACs, SPAs, SSSIs, etc.);

• any locally designated or other site (County Wildlife Sites, RSPB reserves, etc.);

• any habitat occurring in a UK or Devon BAP priority list;

• any species specifically protected by UK legislation, or habitat/features which specifically support them; or

• species identified by other means as under threat (such as red list species or UK or Devon BAP priority species).

3.10 The following features, habitats and species were identified to be present (or potentially present) on the site and considered important using the above criteria:

• Habitats: Hedgerows (Hedgerows Regulations, UK BAP priority habitat, Key Wildlife feature in Devon).

• Features: Mature oak trees (potential bat roosts).

• Species: bats (Conservation of Habitats and Species Regulations 2012, Wildlife and Countryside Act 1981, soprano pipistrelle is a UK BAP priority species, subject to the final
results of the ongoing bat activity survey, so far no Devon BAP bat species have been identified using the proposed development site.


### 3.11 Potential impacts resulting from the proposed development

Potential impacts resulting from the proposed development were assessed by considering the receptor to be affected, its importance, abundance and fragility, and the likelihood of loss or damage to habitats, or injury or disturbance to individuals. The characteristics of potential impacts were considered against the following criteria:

- positive or negative;
- extent (area affected);
- magnitude (amount of effect);
- duration (temporary or permanent, takes into account species life cycle for example);
- frequency and timing (taking into account seasonal issues for example); and
- reversibility (whether a receptor would recover from a specific impact).

### Limitations of the Assessment

3.12 The assessment obtained a good level of baseline information for the site, especially considering its current status as intensively arable ground, which simplified the habitat identification required. The existing land use reduced the likelihood of the site supporting a number of groups which would otherwise require consideration.

3.13 One species (dormouse) was assumed to potentially be present in low numbers. This assumption was made on the basis that dormice are known to occur in the vicinity of the site, and are now known to utilise hedgerows more frequently than had previously been considered. Hedgerow condition at the site was much less than optimal for dormice, being generally very heavily managed and tightly trimmed. However, it was not possible to completely discount the presence of dormice within these hedges, and it was considered that their presence at very low levels may well not be verified by normal survey effort. Given the nature of the potential impacts on this species (discussed in detail in later paragraphs), it was considered appropriate to assume a possible presence.

3.14 Guidance on great crested newts in Devon was followed (Devon County Council and the Devon Local Nature Partnership, 2016) and as a result of the Habitat Suitability Index (HSI) survey and detailed presence/absence survey in those ponds requiring it, there was high confidence in the conclusions that no great crested newts are present in locations which might be affected by the proposed scheme.
3.15 Overall there were few limitations that would affect the robustness of the assessment.

**Assessment of Construction Impacts**

3.16 This section includes a brief description of the baseline conditions present at the site and provides a brief assessment of those which are considered important. A brief review of construction impacts on these habitats is provided and these are reviewed in more detail in relation to the important receptors identified.

**Baseline**

3.17 The baseline description of the site and its ecological receptors was based on the previous reports identified above (Appendices 4.1-4.5). In each case, the ecological value of the features/habitats is discussed.

**Designated Sites**

3.18 The nearest statutorily designated sites are the East Devon Heaths SPA, SAC and SSSI, which lies some 3.51 km to the south of the site. This is the only statutorily designated site within 5 km of the converter station site. East Devon Heaths is a site of national and international importance. It is a nationally important representative of the inland Atlantic-climate, lowland heathlands of Britain and north-west Europe. It supports Northern Atlantic wet heaths and European dry heaths with a number of very important species such as southern damselfly, Dartford warbler and European nightjar. This site was considered important in a national and international basis.

3.19 There were 11 locally designated sites within 2 km of the site, the nearest of which was Beaufort County Wildlife Site (CWS), designated for the small ponds with amphibian interest. Also close by were Great Covert Unconfirmed Wildlife Site (UWS) which is an area of secondary woodland, and Exeter Airport Other Site of Wildlife Interest (OSWI), which supports marshy grassland. These sites were considered to be important in a local context.

**Habitats Present on Site**

**Arable Land**

3.20 The site and its immediate surrounds were dominated by arable fields under intensive crop rotation. A cereal crop had been removed from the fields last year and this year it was planted with a maize fodder crop. Adjacent fields were all in similar arable production. Field headlands were minimal and of little value to wildlife. While “Farmland” is a “key wildlife feature in Devon”, based on the Devon BAP, the flora and fauna species indicated were unlikely to be encountered on the site, due to its intensive management. The ecological value of this habitat was therefore assessed as very low, and it was not considered to be an important ecological receptor.

**Hedgerows**

3.21 The site was bounded by well managed Devon hedgerows with earth banks and a reasonable number of woody species. Basal vegetation was rather sparse within the fields, primarily due to the closeness of arable management. The hedges were regularly managed by flail trimming. There were a number of mature standard oak trees predominantly along the Long Lane Road.
hedge and the hedge which forms the western boundary. A matrix of similar hedgerows bound adjacent fields and is typical of the area. As hedgerows are listed in Section 41 of the NERC Act and appear on the UK and Devon BAP, they were considered to be an important ecological receptor.

**Protected and Otherwise Notable Species**

3.22 The potential was considered for the following species and groups of protected or otherwise notable species to occur on or near to the site:

**Plants and Habitats**

3.23 No records of protected or notable plants were provided within 2 km of the site from the desk study. No rare or notable plants were noted during the Phase 1 habitat survey.

3.24 Due to the intensive management of the majority of the habitats present and the low diversity of floral species identified, the potential for any protected or notable flora to occur was low and notable plants and habitats were not considered to be important ecological receptors.

**Birds**

3.25 The hedges and plantation woodland present within the survey area offer nesting opportunities for common farmland species. The intensive arable production is likely to limit the value of the site for ground nesting birds and even for arable specialists. The field was ploughed and extensively cultivated throughout April and early May in 2016 to plant a maize crop, for example.

3.26 The birds recorded during the desk study could potentially forage on the site and it was originally reported that barn owl, house sparrow and kestrel could potentially find nest sites in the mature trees and hedgerows on the site.

3.27 No features likely to be used by barn owls were noted during the bat roosting inspections. Potential for barn owl foraging at the site was very limited due to the intensive arable management leaving little opportunity for substantial small mammal populations.

3.28 The potential for hedgerows to be for nesting by many common farmland bird species means that they are an important ecological receptor.

**Reptiles and Amphibians**

3.29 One record of a reptile; grass snake was provided in the 2 km radius desk study.

3.30 The survey area offers no realistic opportunities for reptiles due to the intense arable production in the area. The arable habitats are intensively managed and extend close to the field boundaries leaving no margins of sufficient size to support reptiles.

3.31 Great crested newts are not a common species in Devon, but they have also been under-recorded. As a result, Devon County Council and the Devon Local Nature Partnership have produced guidance on when and how they should be surveyed for in Devon (Devon County Council and the Devon Local Nature Partnership, 2016).

3.32 The advice given on great crested newt consultation zones in Devon was followed and all ponds within 500 m of the proposed development, which were not isolated from it by substantial natural
barriers, were subject to a HSI survey (Appendix 3.2). This identified two ponds with suitability
indices of more than 0.6, indicating average habitat suitability or above, and one with an index
very close to 0.6. These three ponds were subject to standard presence/absence survey,
following standard Natural England guidance (English Nature, 2001) (see Appendix 3.3). No
great crested newts were found to be present, although other common amphibian species, such
as common frogs, smooth newts and palmate newts were identified. These species are
protected under the WCA against sale only. The GCN Survey at Appendix 3.3 concludes that the
development proposals are unlikely to have any significant impacts on ponds or terrestrial
habitats likely to be utilised by the amphibians.

3.33 On the basis of the above, reptiles and amphibians were not considered to be important
ecological receptors.

*Dormice*

3.34 Dormice were recorded in one location 1.9 km from the proposed development site and this
population is unlikely to extend as far as the site due to the presence of roads acting as barriers
preventing dispersal.

3.35 The hedgerows in the survey area were not good dormouse habitat on their own due to heavy
management which would reduce their potential as a foraging resource for dormice and would
make nest-building difficult.

3.36 Dormice are relatively common in Devon, however, and their presence cannot be completely
discounted in hedgerows of this nature. As a result of the difficulty in completely discounting their
presence, they were considered as important ecological receptors.

*Badgers*

3.37 A badger sett was found to be present in the south of the survey area along a field boundary, one
field south from Long Lane (shown at TN16 on Figure 9, Confidential Appendix 3.1). Badger
foraging activity was also identified across part of the site.

3.38 The principal aim of the PBA legislation was badger welfare and not conservation, as they are a
common species whose population and range in the UK has expanded over the past four
decades. As badgers are quite mobile and are known to excavate and occupy new setts within
and beyond their existing territories, there is always some risk that additional setts may occur in
areas which could be affected by the proposed development.

3.39 Simply as a result of the above, badgers were considered to be an important ecological receptor.

*Bats*

3.40 The bat roost tree survey (Appendix 3.4) identified three trees with high potential to support bat
roosts, all of which occurred in hedges on the boundary of the converter station site. A further
ten trees were identified with moderate potential, five of which occurred on the hedge boundary
between the proposed site and Long Lane. The remainder occurred on other parts of Long Lane
and on the boundaries of the field immediately to the west of the proposed development site.

3.41 The bat activity surveys (Appendix 3.5) showed that a number of common bat species regularly
utilise the hedges around the proposed development site as a foraging resource. Species
identified included common pipistrelle, soprano pipistrelle, noctule, serotine and an unidentified *Myotis* species. These are relatively common species and although all protected under the CHSR and WCA, other than soprano pipistrelle, they are not UK BAP or Devon priority species.

3.42 Levels of activity tended to commence sometime after sunset, suggesting that the bats were not roosting in the trees immediately adjacent to the site, but commuting some distance to forage there. In addition, a number of bats recorded during both the walked transect surveys and the automated survey carried out over a minimum of three nights per month varied significantly from night to night.

3.43 Observations during the walked survey transects indicated that foraging activity focussed on those areas with large mature standard oak trees, reflecting the value of these individual features, irrespective of their potential for roosting. Additionally, the hedgerows along Long Lane saw significantly higher levels of bat activity than those hedges running perpendicular to them or the parallel hedge forming the northern boundary of the proposed converter station site.

3.44 In conclusion, the site forms a useful foraging resource for common bat species. The use of Long Lane would appear to focus primarily on foraging rather than as a connective flight line. To the west along the lane, lies further industrial areas and the main built infrastructure associated with Exeter Airport, which are not particularly attractive features for bats. Levels of activity to the west along Long Lane were lower than those at or to the east of the existing Environment Agency compound. This compound had overnight security lighting, which served to attract some species such as common and soprano pipistrelles, but may act as a deterrent to other species such as horseshoe bats. A single pass was recorded during the static bat detector surveys of a lesser horseshoe bat. Lesser horseshoes are one of four bat species which are considered a priority in Devon.

3.45 Bats and the individual mature standard oak trees which seem to benefit them were therefore assessed as important ecological receptors.

**Important Receptors**

3.46 The following receptors are considered to be important and impacts upon them resulting from the proposed development should be avoided or otherwise mitigated. Impacts on this group of receptors are considered below.

- Nationally and internationally designated sites: East Devon Heaths SAC, SPA and SSSI.
- Locally designated sites: Beautiport CWS, Great Covert UWS and Exeter Airport OSWI.
- Hedgerows.
- Individual Oak Trees.
- Birds.
- Bats.
- Dormice.
• Badgers.

**Construction Impacts**

3.47 The proposed development design would retain the majority of hedgerows forming the site boundary and retain all the mature oak standard trees associated with the hedges.

3.48 Construction activities without mitigation could include a number of potential impacts on important ecological receptors, including:

- Temporary and permanent habitat loss, particularly potential permanent loss of hedgerow for access along and from Long Lane, and temporary hedgerow loss for cable access into and out of the site;
- Temporary disturbance to wildlife using features on the site from increased human activity;
- Temporary disturbance to wildlife using features on the site from construction noise levels;
- Temporary disturbance to wildlife using features on the site from construction lighting;
- Potential for long term impacts to adjacent areas of habitats (particularly hedgerows or ditches) resulting from inappropriate storage or handling of toxic or otherwise deleterious construction materials;
- Potential for temporary effects on ditches and water-courses resulting from inappropriate management of temporary works drainage during the construction period (and the risk of this acting as a pathway for further contamination in the event of a spillage of material as described above);
- Potential for injury to individual animals by falling into open trenches and becoming trapped.

**Specific Construction Impacts on Important Ecological Receptors**

3.49 The following paragraphs consider how construction is likely to impact the important ecological receptors, taking into account the mitigation measures outlined later in this chapter.

**Nationally Designated Sites – East Devon Heaths SSSI**

3.50 The proposed development site is some distance from the East Devon Heaths area. There would be no direct impacts in terms of land take or disturbance from noise or light or increased human activity.

3.51 It is unlikely that the construction of the proposed development would generate sufficient changes to air quality to have any impacts upon the heathlands. In accordance with guidance from the Institute of Air Quality Management, ecological impacts have been scoped out of the air quality assessment in Chapter 6 on the basis that there are no ecological designations within 50 m of the site boundary or within 50 m of site traffic routes for a distance of up to 500 m from the site entrance.
Accidental contamination incidents resulting from spillages or inappropriate storage of fuel or other chemicals on site would also be unlikely to affect the heathlands due to the rising topography which would prevent a water-borne contamination pathway from occurring. As outlined in Chapter 9, the potential for localised contamination of the soil and possibly groundwater (where permeable layers of the Secondary B Aquifer are present) would be controlled by the employment of pollution prevention measures during construction and from the drainage design during operation of the converter station.

Construction of the proposed development would therefore have no impacts on the East Devon Heathlands designated areas.

Locally Designated Sites

Construction impacts on locally designated sites are also considered to be limited. There would be no direct land take, and disturbance from noise, light or increased human activity would be unlikely factors.

There was some risk that air-borne pollutants (most likely small particulates from construction dust) could be deposited on the closer sites, although assuming good construction practice methods outlined below are adopted, this is unlikely to occur.

Similarly, the inclusion of good construction practice in the temporary drainage and water-management of the construction site would prevent the discharge of silts into the local drainage system which could potentially become a contamination pathway to the locally designated sites.

Linked to this is the requirement for good practice in handling and storage of fuels and other potentially toxic chemicals, which should prevent the possibility of any potential spillages or other accidents from contaminating areas beyond the site.

Hedgerows and Individual Oak trees

Formation of two new entrances off Long Lane along the southern boundary of the proposed development site will avoid the existing mature standard oak trees.

Although hedges are to be largely retained there is some risk of inadvertent damage during construction either by direct impact with machinery, storing soils or other materials on top of the hedges, or simply by compaction of roots, particularly relating to the mature trees.

A plan to protect the retained hedgerows and trees will be put in place, which means that serious impacts on the retained hedges and trees would be avoided. Additionally this protective zone created by protective fencing would also serve to reduce construction disturbance to wildlife which may be sheltering or otherwise utilising the hedges.

Some mature trees along Long Lane may require some crown lifting to allow large vehicles to pass.

Birds

Clearance of vegetation during the nesting season would be likely to disturb nesting birds and possibly damage their nests and or eggs. This would constitute an offence under the WCA. The vegetation of primary importance for the site would be the hedgerows, but ground-nesting birds
might also nest on the field at the site, if left fallow for a full season before commencement. However, timing site clearance to avoid the nesting season would prevent such issues, and the construction of the proposed development would be unlikely to cause other impacts to birds in the area.

Bats

3.63 The design of the proposed development avoids the need to remove any trees with moderate or high potential for bat roosting, and the hedges which were used by bats as flight-lines and foraging routes would be retained. Impacts from these elements would therefore be unlikely.

3.64 There is some potential for disturbance to possible roosts as a result of construction activity, particularly from noise and possibly from construction lighting, if required. A sensitive noise management plan and appropriate temporary lighting design, if required, would assist in reducing these impacts to acceptable levels.

3.65 There is also some risk of disturbance to bats using the hedges and trees for commuting or foraging if construction activity is regularly carried out at night and particularly if it was using lighting which over-spills onto the retained boundary hedges and road adjacent to the site. Measures to implement a sensitive construction lighting scheme and ideally avoid night working, particularly in the period from April to October when bats are most active, will reduce these potential impacts on bats to a negligible level.

Dormice

3.66 Activities which directly affect or disturb the hedgerows would be the only ones with potential to directly affect dormice, if they were present.

3.67 This would include the construction of new entrances from Long Lane, and any temporary hedge removal for cable connection to the site. These would be relatively small gaps in the hedges and would constitute much less than the size of a dormouse’s home range which is estimated at 300 m of hedgerow in the Dormouse Conservation Handbook (Natural England, 2006). Such gaps could cause some severance from the remainder of the dormice’s home range if undertaken suddenly when dormice are active. In the longer term, the creation of such gaps would also be counteracted by the closure of existing gateways as a part of the proposed outline landscape design.

3.68 There would also be some risk of injury to a dormouse, should it be occupying a hibernation nest in the clearance area. Hibernation nests are usually built at ground level in sheltered, cool, slightly damp locations, such as in the root zones. When active, dormice spend most of their time off the ground in the canopy, and summer nests are built in vegetation above ground.

3.69 Increased human and machinery activity immediately adjacent to hedgerows from the construction would also potentially increase levels of disturbance to dormice, above that which is currently generated by agricultural use of the field.

3.70 However, measures to protect the hedges and trees from construction damage, along with measures to phase clearance of any gaps required in the hedges (whether temporary or permanent) would reduce impact levels on any dormice (if present) to very low levels.
Badgers

3.71 It is unlikely that the proposed development would have significant impacts on the badger foraging territory, and would not be sufficiently close to the sett to damage or disturb it in a way which would require licensing under the Protection of Badgers Act 1992.

Assessment of Operational Impacts

3.72 Operational impacts without mitigation could result in the following negative impacts:

- permanent regular disturbance due to ongoing permanent lighting or regular night working at the site;
- potential for run-off from the hard-standing of the converter station to modify and affect local ditches and watercourses, with the possibility that this could become a pathway for contamination in the event of a spillage or other incident occurring during operation (see Chapter 8: Hydrology and Flood Risk); and
- reduction in value of habitats due to inappropriate management of existing hedge features and woodland buffer planting.

Specific Operational Impacts

3.73 The following paragraphs considered how operational impacts were likely to affect the important ecological receptors, taking into account the mitigation measures outlined below.

Designated Sites

3.74 Operation of the converter station would be very unlikely to have any impacts on the nationally or internationally designated areas identified.

3.75 Any risks associated with contamination incidents would be managed with an emergency plan as described below, and while there is a theoretical contamination pathway which could make contact with the Beauitport CWS and Exeter Airport OSWI, there is little opportunity for contact with the East Devon Heaths sites.

3.76 On this basis, impacts on designated sites from operation would be unlikely.

Hedgerows

3.77 The impact of operation on hedgerows is likely to result in a net long-term beneficial impact as a result of closing existing gaps and implementation of an improved management regime (see Figure 2.7: Landscape Plan).

Individual Oak Trees

3.78 As the oak trees would be retained, there would be no negative impacts on this feature from the operation of the converter station.
Birds

3.79 Operation of the converter station would result in a net medium to long-term beneficial impact as a result of less disturbed hedgerow and as increasingly valuable woodland buffer strip planting becomes established over time, offering additional nesting habitats.

Bats

3.80 Similarly, the effects of operation on bats would result in a net medium-long-term beneficial impact as a result of retention of the existing oak trees, coupled with the establishment of increased foraging areas associated with the woodland buffer planting areas.

Dormice

3.81 The effects on dormice, if present, during the operation of the converter station would also be positive, with the establishment of the woodland buffer strips offering increased areas of useful dormouse habitat.

Badgers

3.82 Operation of the converter station would be unlikely to have any impacts on badgers, which may enter the new woodland planting strips, although these strips are unlikely to offer a substantial increase in foraging value over the existing arable field for this species.

Cumulative Impacts

3.83 The developments identified for consideration are identified on Figure 2.9 and Appendix 2.2.

3.84 The closest developments to the proposed converter station site are the proposed industrial units, roadways, parking and infrastructure at McBains Business Units (ref.16/1578/MFUL), which are an extension of the existing business park and close to the existing EA compound. The development of additional industrial units may serve to further reduce the value of the converter station site (particularly existing hedgerows) as a green corridor facilitating the movement of species westwards along Long Lane. The improvements likely to occur as a result of the proposed converter station outline landscape design will assist in ameliorating any negative effects to species such as bats which could occur from the development at McBains. The development of the converter station would therefore not contribute to additional impacts to the McBains development.

3.85 The majority of other developments occur to the north of the proposed converter station site in a broad band roughly along the River Clyst valley. The runway of Exeter Airport lies between this band of development and the proposed converter station site. This is likely to act as a severing feature and limit migration of wildlife in either direction. The development of the converter station is unlikely to increase the ecological impacts associated with the broad band of development to the north, and benefits associated with the proposed outline landscape planting in improving the value of the converter site in the longer term may also help in strengthening the landscape alongside the A30 corridor for wildlife.

3.86 The cumulative impacts assessment has identified limited numbers of developments to the south of the proposed converter station site. These are separated from the converter station site by the
busy A30 trunk road. Cumulative impacts resulting from the development of the proposed converter station in addition to the solar array and wood gasification plant would be negligible.

**Proposed Mitigation Measures**

3.87 Mitigation measures were devised to address potential impacts on the individual important ecological receptors, although in many cases they are interlinked and likely to be of benefit to more than one species/group. The mitigation measures here refer to mitigation required both during the construction period and in the longer term during the operational phase.

**Nationally and Locally Designated Sites**

3.88 Mitigation measures during construction which will manage any potential impacts on both local and nationally designated sites relate specifically to good construction working practice to ensure that sound environmental practice is in place. This will include the following measures.

3.89 Dust generated during construction would be suppressed by the use of damping using bowsers or other measures. These measures are described in more detail in Chapter 6.

3.90 Construction would require an appropriate temporary drainage plan, designed to ensure that any run-off or other waters generated during construction were suitably contained and treated prior to discharge. These measures are described in more detail in Chapter 8. This would prevent the deposition of water-borne solids onto designated areas (and possibly ponds) through the local field ditch system.

3.91 The ditch system was not particularly strongly defined in the area around the proposed development site, and is unlikely to be a well-defined pathway for water-borne contamination. However, good housekeeping measures particularly relating to storage and use of fuels and other toxic substances would be in place and adhered to. These measures are described in Chapter 6.

3.92 A suitable emergency plan relating to unexpected spillages, ruptures or other contamination incidents will be in place, and all operatives and contractors briefed on the appropriate actions to take.

3.93 During operation of the converter station, a similar plan detailing how fuels or any other toxic materials should be handled and stored would be detailed. An emergency procedure plan will be in place which includes details of the appropriate action chain necessary in the event of a serious contamination incident.

**Hedgerows**

3.94 All temporary gaps in hedgerows will be replaced on a like for like basis (i.e. with full hedge bank reinstatement and appropriate planting with suitable species of local provenance). As shown on Figure 2.7: Illustrative Landscape Plan proposed additional buffer planting alongside the existing hedges would consist of locally-occurring woodland species of local provenance.

3.95 All excavations and earthworks for the construction of the converter station will be carried out outside of the canopy area to prevent damage to mature standard trees within the hedges. Such protective strips will be fenced off to prevent accidental encroachment during the works.
3.96 Existing gateways at the south west and south east corners and midway along the northern boundary hedge of the proposed converter station will be infilled with hedge-bank and appropriate locally-occurring planting to compensate for creation of new permanent access gates from Long Lane. Timing of these operations should comply with the phased approach for dormice described below. Details of hedgerow reinstatement should follow the guidance set out in Natural England’s Technical Information Note 039 (Natural England, 2008) and guidance from the Devon Hedge Group (Devon County Council and Devon Hedge Group, 1998).

3.97 Planting of internal woodland and scrub buffer areas will be done in a sensitive manner and include a diverse mix of appropriate locally-occurring species, of local provenance.

3.98 A simple management plan should be created to ensure ongoing appropriate management of hedgerows and that new woodland buffer planting is maintained. This should include as a minimum the following measures:

- regularly trim hedgerows on a biannual basis (more frequently may be required for hedgerow along Long Lane for safety reasons);
- carry out maintenance to ensure that new woodland planting establishes well, including careful spot-spraying or brush-cutting to ensure new planting establishes and thinning/guard removal as required;
- prevent encroachment of woodland planting onto operational areas; and
- undertake trimming and management outside of the regular bird nesting period of March-August inclusive.

**Individual Oak Trees**

3.99 The individual oak trees will be avoided during construction and so no specific mitigation is required, other than root/canopy protection as outlined above.

3.100 Where there is any need for crown lifting or other limb removal to allow oversized loads along Long Lane, these will be carried out in accordance with guidance in BS 3998:2010 (BSI 2010).

**Birds**

3.101 Any site clearance of vegetation should avoid the bird nesting season where possible, which runs approximately from March-August inclusive (although nesting birds and their eggs are protected at any time under the WCA).

3.102 This should include any clearance associated with hedgerows (assumed to be limited to new access point and cable entry and exit points).

3.103 However, if the field itself is left fallow for a farming cycle prior to commencement of construction works, it should also be considered as potential bird-nesting habitats. For example, if a crop is removed from the field in September of the previous year and it is then left un-managed until April of the following year, it should not be assumed to be free of nesting birds, as such conditions may attract some species of ground-nesting birds.
Where initial site clearance within the bird nesting season cannot be avoided, it will be necessary to carry out detailed inspections by suitably experienced ecologists to ensure that no nests are present. Should active nests be encountered, suitable exclusion zones would need to be set up (advised by the ecologist on the basis of the nest location and species of bird involved).

**Bats**

Retention of individual trees and hedgerows (including reinstatement of existing gateways) would be of benefit to bats as these are the features currently used by all species present in the area.

3.106 If temporary works lighting and night works are required during the period March-October when bats are likely to be most active, a temporary lighting design should be developed and agreed between the contractor and a suitably experienced bat ecologist to limit the extent of light spill onto the boundary hedges. Although lighting attracts some species of bats, it deters others, and the aim should be to maintain similar lower lighting conditions to that presently in place in an area which is somewhat over-lit already due to the presence of the Environment Agency storage compound, nearby A30 and airport runway and other facilities.

3.107 Permanent operational lighting will not be required and that a similar lighting state to that currently in the area would be maintained, which would therefore have no impact on bats (for the same reasons described above). If occasional lighting is required during the operational phase, the lighting design will be low level down-lit and would only be used during operational visits. This would avoid light spill onto the existing hedgerows and, as far as possible, on the new woodland planting buffers (which would increase screening of light as they develop in any case).

3.108 Although not required for the construction of the proposed development, should any of the trees identified with moderate or high potential for bat roosts require removal, either unexpectedly as a part of the construction works, or in the longer term, they should be thoroughly assessed for the presence of bat roosts by a suitably qualified, experienced and licensed bat ecologist, prior to these works. Sufficient time should be allowed to obtain a licence under the CHSR for the closure of a bat roost, should this be required. As with all wildlife mitigation licenses, a detailed mitigation method statement demonstrating how all measures outlined can be achieved would be required to accompany any application.

**Dormice**

The presence of dormice is unlikely, but cannot be completely ruled out. As a precautionary measure, where the proposed development requires hedgerow removal, whether temporary or permanent, it should be carried out following a phased approach as set out in the Dormouse Conservation Handbook (Bright et al, 2006).

This indicates that it is appropriate to remove upstanding vegetation (trees and shrubs) during the period November to March while dormice would be in hibernation, utilising hibernation nests located on the ground at base of trees etc. On awakening in April or May, dormice would be persuaded to move into adjacent un-cleared areas which would still be within their home range (averaging 50 m), avoiding potential issues of conflicts between dormice which are strongly territorial. Clearance of upstanding vegetation during this period has the additional benefit that it is done during the period when birds are unlikely to be nesting.
3.111 Clearance of the ground levels (including hedge-banks) can then be undertaken in the period June-September, when any dormice present would be active and living within the hedge canopy.

3.112 Prior to each phase of clearance the area should be inspected by a suitably experienced dormouse ecologist to ensure that no dormice are present which could be injured by the clearance works. These should inspect all basal areas prior to commencement of winter vegetation clearance to ensure no hibernation nests are present.

**Badgers**

3.113 Although badgers are not considered to be at risk of impacts as a result of the proposed development, measures have been included here to ensure that the status of badgers has not changed prior to commencement of the proposed development.

3.114 Badgers are quite dynamic and may excavate and occupy new setts within their existing territory, or occupy neighbouring territories, it will be necessary to ensure the current status is checked and confirmed again prior to commencement of construction. A pre-commencement badger survey by a suitably experienced badger surveyor should be undertaken no more than 6 months prior to commencement of construction to ensure that no new setts have been excavated in any location which would be damaged or badger using it disturbed by the works. Should any such setts be identified, an appropriate licence under the PBA should be sought from Natural England. Any such application would need to be accompanied by a suitably robust and demonstrably deliverable mitigation scheme.

**Future Monitoring**

3.115 Monitoring of the site should be undertaken to inspect establishment and condition of habitats created such as any hedgerow reinstatement and the woodland buffer strips.

3.116 Monitoring of these habitats should be at regular monthly intervals for the first two years, reducing to quarterly in the third year and annually thereafter. Ongoing monitoring of habitats should be undertaken by those who will be responsible for long term management of the site.

3.117 If any licences are required under the CHSR or PBA, one of the requirements of these licenses is likely to be ongoing monitoring of mitigation and possibly the population affected, and these measures will need to be complied with and reported as required.

**Summary**

3.118 The construction and operation of the converter station at this location would have the potential for limited short term negative impacts on a number of important ecological receptors, the impacts of which could be reduced by simple mitigation measures.

3.119 There are longer-term benefits which would be likely to occur particularly to local wildlife species and groups such as birds and bats, resulting from the retention and maintenance of existing hedges and matures trees, reinforced by the planting of woodland and scrub buffer strips.
References


4 Landscape and Visual Impact Assessment

Introduction

4.1 This chapter appraises the likelihood of landscape and visual impacts of the proposed FAB Link HVDC converter station development options near Exeter Airport. This chapter draws on relevant topic guidance and consultation to inform the appraisal and sets out the proposed measures to mitigate any potential adverse impacts.

4.2 This report provides a consideration of the site within the context of the immediate Application Site and surrounding landscape. It outlines the existing baseline conditions in terms of topography, vegetation cover and land uses, published landscape character studies and other relevant designations, and the current visibility of the site. The likely landscape and visual effects of the two proposed development options of the project are assessed against the existing baseline scenario.

4.3 Planning policy of relevance to the application insofar as it relates to landscape and visual matters is also considered in this document.

Policy and Guidance

National Planning Policy

4.4 The Department for Communities and Local Government (DCLG) published the National Planning Policy Framework (NPPF) in March 2012 (DCLG, 2012). The document sets out broad aims to achieve sustainable development.

4.5 There are general policies about achieving high quality and inclusive design for all development (Paragraph 57). This is to ensure that developments will function well and add to the overall quality of the area, establish a strong sense of place and create an attractive and comfortable place to visit. Proposals should optimise the potential of the site to accommodate development. Developments should respond to the local character and history and reflect the identity of local surroundings and materials whilst not discouraging innovative design. The development should create safe and accessible environments that are visually attractive with appropriate landscaping (Paragraph 58).

4.6 The Government attaches great importance to good design. New development should take into consideration the overall scale, density, massing, height, height, landscape, layout, materials and access arrangements in relation to neighbouring buildings and the local area more generally (Paragraph 59).

4.7 Local planning authorities should not refuse planning permission for buildings or infrastructure which promotes high levels of sustainability because of concerns about incompatibility with existing townscape, if those concerns have been mitigated by good design (Paragraph 65).

4.8 Chapter 11: Conserving and Enhancing the Natural Environment, highlights the importance of protecting valued landscapes. Paragraph 115 states that “Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding
4.9 The use of previously developed land should be encouraged and the remediation and mitigation of despoiled, degraded or derelict land. The creation, protection, enhancement and management of networks of biodiversity and green infrastructure should be planned for (Paragraph 114).

4.10 In summary, the NPPF policies set out to improve the overall quality of an area, establish a strong sense of place and create an attractive and comfortable location, responding to the local character. National policies seek to conserve, protect and enhance valued landscapes and provide protection of scenic areas within nationally designated areas such as Areas of Outstanding Natural Beauty (AONBs).

Relevant Guidance

4.11 As a matter of best practice, the assessment has been undertaken based on the relevant guidance on landscape and visual assessment. This includes:


Consultation

4.12 A summary of all consultation with stakeholders or consultees relevant to the LVIA process is detailed in Table 4.1 below.

Table 4.1: Consultation Responses Relevant to this Chapter

<table>
<thead>
<tr>
<th>Date</th>
<th>Consultee and Issues Raised</th>
<th>How/ Where Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>14th April 2013</td>
<td>Sarah Foque, Landscape Architect on the Major Projects Team for East Devon District Council identified a number of additional representative viewpoints that required consideration in the course of the LVIA.</td>
<td>The additional viewpoint locations were visited during the site visit on 20th April and a photographic record of views towards the Application Site made.</td>
</tr>
</tbody>
</table>

Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty."
Assessment Methodology

4.13 The methodology used for this assessment is set out at Appendix 4.1. This assessment reviews the landscape and visual baseline conditions, and then considers the likely effects of the project in relation to the baseline conditions during the construction and operational phases.

Study Area

4.14 The study area has been defined for the assessment based on site survey and the identification of the zone of theoretical visibility (ZTV) for the project as shown on Figure 4.1. The study area was established at a 5km radius from the Application Site.

Baseline Methodology

4.15 A desk top review of published data, such as landscape character assessments, Ordnance Survey (OS) maps and aerial photography was carried out. This identified potential landscape, townscape and visual receptors that could be affected by the project. A field survey was carried out on 20th April 2016 and the findings were combined with information from previous site visits in order to confirm the initial findings of the desk top review and to assess the likely effects on landscape, townscape and visual receptors.

Assessment Criteria and Assignment of Significance

4.16 Landscape and visual effects have been determined, taking into account the receptor sensitivity and the predicted magnitude of the change arising from the project. Appendix 4.1 sets out the indicative criteria used to guide the assessment of significance. It should be emphasised that, while the criteria are set out to ensure that the methodology is robust and transparent, professional judgement has been used to determine the significance of each effect.

4.17 This assessment of visual effects is based on views from publicly accessible locations, and where effects on residential and other private views (e.g. commercial occupiers) is noted this has, necessarily, been estimated based on the nearest publicly available viewpoint and professional judgement.

4.18 The viewpoints identified in this assessment are illustrative of the likely effect from a representative range of receptors, including residences, rights of way, public open spaces and the road network.

Limitations of the Assessment

4.19 The LVIA process is based upon a professional judgement of effects using a robust and fit for purpose methodology. There is an element of subjectivity to Landscape and Visual Impact Assessments, which must rely upon qualitative assessments by landscape professionals. The subjective nature of the LVIA process is minimised by the presentation of a transparent assessment of professional judgement that is supported by reasoned argument according to the definitions provided in a robust methodology.

4.20 On page 21, the GLVIA3 states;
“In all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others.” (Landscape Institute and Institute of Environmental Management and Assessment, 2013)

4.21 As such, subjective evaluation is not a limitation to the assessment process that affects the robustness of this LVIA.

Baseline Environment

Site Context

4.22 The Application Site is located on an area of arable farmland off Long Lane to the south-east of Exeter International Airport runway. The boundaries of the Application Site are formed by mature and well maintained hedgerows with some mature oak hedgerow trees. Although the Application Site is bounded by hedgerows on all four sides, the field has a sense of openness due to views available to the north over the relatively flat ground. The temporary laydown area would be located to the west of the Application Site on the land immediately adjacent to it (see Figure 2.2).

4.23 Development in the immediate vicinity of the Application Site is limited to the nearby industrial units at the Antiques Complex and farmyards to the east and north-east. The industrial development around the Antiques Complex comprises a number of mixed development types and uses, including storage units, workshops and retail. The industrial development reflects the large scale development associated with Exeter International Airport to the west.

4.24 Much of the land to the north of the Application Site makes up the airport runway and is lower than the ground level of the Application Site. To the south, the raised carriageway of the A30 further adds to the disturbance of the local landscape.

4.25 The Application Site has no public accessibility and does not feature in any key views from publicly accessible land. However, the boundary hedgerows and hedgerow trees are recognised as landscape assets that are locally familiar. As a result, the Application Site has a medium sensitivity to change.

Landform and Drainage Features

4.26 The Application Site lies on relatively flat land that slopes gently to the north from approximately 42 m above ordnance datum (AOD) at its highest point to approximately 37 m AOD at its lowest point. There are no water courses that cross the Application Site or located immediately outside it. Drainage ditches and ponds are located on field boundaries of adjacent fields.

Land Use and Land Cover

4.27 The Application Site comprises a rectangular field that is in active agricultural use and on the date of the most recent site visit was recently ploughed, leaving bare earth. The boundaries of the Application Site are formed by mixed native hedgerows that are well maintained with hedgerow trees of mature oaks on the southern and western boundaries.
Public Rights of Way

4.28 There are no Public Rights of Way crossing the land in close proximity to the Application Site and public access is limited to the minor road of Long Lane on the southern boundary.

Designations

4.29 The site is not covered by any landscape designations but lies approximately 900 m west of the Grade II Registered Park and Garden of Rockbeare Manor. Designations within the study area are shown on Figure 4.1.

Existing Landscape Character

National Character Area Profile

4.30 The proposed development site lies within National Character Area 148: Devon Redlands, as defined in Natural England’s (formerly the Countryside Agency and English Nature) Joint Character of England Map (1996) which divides England into 159 Joint Character Areas and is shown on Figure 4.2. The key characteristics of the Devon Redlands are:

- ‘Hilly landscape of villages, hamlets, farmsteads, hedgebanks and winding sunken lanes, rising in height towards the fringes of the NCA. Steep-sided but flat-bottomed river valleys cut through the hills, opening onto wide flood plains which are important for wintering wildfowl nearer the coast.

- Red soils derived from the Permo-Triassic sandstone and red-tinged cob buildings give the name to this NCA.

- Large woodlands confined mainly to steep valley sides. In upper valleys small, broadleaved woodlands and copses give a strong sense of enclosure and provide valuable habitat for wildlife. There is a high concentration of ancient semi-natural woodland in the northern part of the NCA.

- Mixed farming predominates, but as the land rises in the transitional areas towards Dartmoor and Exmoor pasture becomes widespread. Fields tend to be small and irregular with dense hedgerows on top of earthbanks in the transitional areas, while there is a larger, more open field pattern elsewhere.

- A high frequency of designed landscapes.

- Cob, red sandstone and thatch buildings are distinctive of the area.

- Distinctive area of the East Devon Pebblebed Heaths on infertile, acidic soils supporting important populations of birds such as the hobby, nightjar and Dartford warbler, and butterflies such as the studded blue. The area is also nationally important for relict prehistoric landscapes and features.

- Estuaries with reedbeds and salt and grazing marshes.
• Striking red sandstone cliffs with well-developed wave-cut platforms and stacks.

• Significant urban development around the estuaries and along the coast. The motorway and trunk road network linking Devon and Cornwall with the rest of the country cuts through the landscape, exposing the red sandstone. It converges around Exeter, a historic city and now a key regional centre.

• The Haldon Ridge, a coniferous plantation with remnant heath, forms a landscape setting for Exeter and the settlements around the Exe.'

4.31 The large National Character Area (NCA) has a medium sensitivity to change due to the presence of designated landscapes and the fact that the Devon Redlands border a number of AONB landscapes. The large settlement of Exeter and the airport development to the east form detracting landscape elements that are obvious in the NCA.

Devon’s Landscape Character Assessment

4.32 The Application Site is located within the East Devon Area and the Clyst Lowland Farmlands Landscape Character Area, as identified by the Devon Landscape Character Assessment and shown on Figure 4.3. The Distinctive Characteristics of the Clyst Lowland Farmland are:

• ‘Lowland, undulating farmed landscape underlain by mudstones, siltstones and sandstones.

• Landscape crossed by streams and meandering watercourses which feed into the more distinct valleys of the Clyst (a tributary to the Exe) and the Tale (a tributary to the Otter).

• Higher ground to the north at Budlake (harder igneous geology) providing a more distinctive and often wooded skyline.

• Generally well treed appearance due to significant numbers of hedgerow trees although few woodlands with exception of Killerton Estate (part of Ashclyst Forest).

• Notable small orchards often on the outskirts of villages.

• Mixture of small to medium scale fields often with curving boundaries reflecting medieval origin.

• Mixed farming including arable and some pasture along watercourses where there is seasonal flooding, as well as areas of horticulture and hobby farming.

• Nature conservation interest provided by unimproved neutral grassland and marshy grassland, particularly fringing streams and plantation/semi-natural and ancient woodland in the north-west.

• Historic parkland in the north-west of this area with notable areas of parkland and veteran trees.
• Dispersed pattern of small villages (particularly along the watercourses many with ‘Clyst’ place names), dispersed farmsteads and town of Honiton.

• Strong local vernacular of cob and thatch.

• Overarching perceptions of tranquillity and quintessential English lowland farmland when away from infrastructure and communication corridors and a sense of isolation in parts.

• Views to surrounding ridges of higher land.’

4.33 A proportion of the Study Area is also covered by the Pebble Bed Heaths and Farmland Landscape Character Area but no part of the proposed development would take place within it (see Figure 4.3). Where changes to the Landscape Character Area are generated by the proposed development, they would be indirect, perceived changes that would not cause any significant effects and as such are not considered further in this assessment.

4.34 Within the Clyst Lowland Farmland, the Application Site is located within the Landscape Character Type 3E: Lowland Plains. The key characteristics of the Landscape Character Type (LCT) (formerly known as 4D) are set out below:

• Level to gently sloping or rolling plain.

• Mixed farmland with other land uses, possibly extractive industry or commercial development.

• Orchards sometimes common.

• Settlement pattern varies according to location, from sparsely to densely settled, with a mixed pattern of villages and hamlets.

• Regular or irregular medium to large scale field pattern.

• Local dominance of stone as building material, but great variety of materials and styles throughout.

• Variable woodland pattern, sometimes with small discrete woodlands, large plantations, hilltop beech clumps or linear amenity planting.

• Roadside hedges. Hedgerow trees may be sparse or dominant.

• Variable highway network from sparse to major roads.

• Long views variable in quality, sometimes marred by pylons and communication masts.

• Surprising feeling of remoteness in some parts.

4.35 The Lowland Plains have a medium sensitivity to change due to the influence of Exeter International Airport and the major communication networks.
4.36 The Study Area also contains Character Type 1C: Pebble Bed Heaths; Character Type 3B: Lower Rolling Farmed and Settled Valley Slopes; Character Type 3C: Sparsely Settled Farmed Valley Floors; and Character Type 7: Main Cities and Towns. No part of the proposed development would take place within any of these additional Character Types. Where changes to the Landscape Character Types are caused by the proposed development, they would be indirect, perceived changes that would not cause any significant effects and as such are not considered further in this assessment.

East Devon Landscape Character Assessment and Management Guidelines

4.37 The East Devon Landscape Character Assessment and Management Guidelines identify the Application Site as being located within the LCT 4D: Lowland Plains (see Figure 4.4), and the key characteristics are as set out by the Devon Landscape Character Assessment for the Lowland Plains LCT (East Devon District Council et al, 2008).

4.38 The Management Guidelines aim to encourage the gapping up of hedgerows with locally indigenous species as well as the maintenance and increased planting of hedgerow oaks to provide vertical elements that help to screen development. The Management Guidelines also recommend that woodland and copses should be included in development proposals.

Designated Landscapes

4.39 The Grade II Registered Park and Garden of Rockbeare Manor is a late 18th and early 19th Century parkland and pleasure grounds that are laid out around the private residence of Rockbeare Manor and is located approximately 900 m to the east of the Application Site. The designated landscape has a high level of plantation woodland, particularly around the boundaries. Rockbeare Manor parkland has a high sensitivity to change.

Visual Baseline

4.40 A preliminary visual assessment was conducted on the 20th April 2016 to verify the desk study findings and confirm the extent of visual influence of the Application Site in its current state.

4.41 Principal viewpoints, sensitive visual receptors and the approximate visibility of the land within the proposal site have been recorded from representative publicly accessible viewpoints. Photographs have been taken using a digital camera from the representative viewpoints as a record of the view and have been taken with a fixed 50 mm lens on a 35 mm camera in landscape format at eye level, approximately 1.6 m above ground level from public viewpoints. Generally, no access to private properties was obtained, and where impact to residential and other private views is noted, this has necessarily been estimated.

4.42 During the site visit, viewpoint photography was undertaken to capture the visual baseline from a number of locations at varying distance and direction from the Application Site. Those views that are determined to be more likely to show higher levels of change and more significant effects from the proposed development have been included as Representative Viewpoints while some Context Photos have been included at Appendix 4.2.

Residential Properties
Visual receptors within residential properties are considered to have a high sensitivity to changes in visual amenity. The windows of ground floor and living rooms are considered particularly sensitive views, while receptors spend less time in bedrooms and gardens. The following section discusses the visual amenity that receptors witness at what are considered to be the most sensitive residential properties due to their proximity to the Application Site.

Antiques Complex

The residential properties within the Antiques Complex to the west of the converter station site are well contained by the existing development that surrounds them. Views are very short in extent and are heavily cluttered due to the existing development and land uses. The mature vegetation of the remnant field boundary to the east of the residential properties further limits views and prevents any visibility of the Application Site to the east. The unremarkable views available from the residential property at the Antiques Complex do not extend to any important locations and there are no key views.

Southwood Farms

Higher Southwood Farm is the closest residential property to the Application Site and is located approximately 400 m to the north-east and is surrounded by other farm buildings. The farmhouse is orientated to face the south and into the farmyard with some views over the pasture fields to the north from the rear of the property. The large farm buildings that occupy the farmyard to the south of the farmhouse limit views for visual receptors within the property and its curtilage allowing only partial views south over the farmyard from upper floor windows. Where more open views are available to the north and north-east, they extend over the pasture fields.

Lower Southwood Farm is located approximately 400 m to the east of the Application Site and is orientated to the south. Farm buildings are mainly located immediately to the north of the property with a couple of barns to the south of the residential garden, over the minor road. Views for visual receptors within the property and its curtilage are generally confined to the immediate vicinity by the farm buildings and ornamental vegetation. Some views from upper floor windows are available to the west over the barns at Higher Southwood Farm and the farmland of the relatively flat area.

Woodhouse Farm

The residential property of Woodhouse is located approximately 830 m to the north-east of the Application Site and is orientated to face west. This gives visual receptors within the property clear views over the runway of Exeter International Airport and the surrounding pasture fields that are divided by well-maintained hedgerows with occasional hedgerow trees. The long views available to the west extend over the industrial development around Exeter International Airport towards the elevated land at Pinhoe beyond. Oblique views to the north include the new residential and industrial development at Cranbrook and oblique views to the south include Higher Southwood Farm, the antiques Complex and the Application Site.

The three properties on Silver Lane to the south of Woodhouse Farm allow visual receptors within them some views from windows and their curtilages to the west. Views over the agricultural farmland extend towards Exeter International Airport and the elevated land beyond.
Views from these properties and their curtilages include the existing development at Higher Southwood Farm, the Business Park at Exeter International Airport and the Antiques Complex amongst the rural fields and hedgerows of the farmland.

**Rockbeare Manor**

4.49 Visual receptors within the residential property of Rockbeare Manor have the majority of views from the property contained by the extensive estate woodland. Views to the south-west are limited by the vegetation of the plantation woodland and individual parkland trees that form the extent of the views. Views to the west and north-west are limited by the individual parkland trees and recent plantations. Views to the south are limited by the dense mature vegetation that lines the boundary of the Rockbeare Estate and Rag Lane. Views to the north and north-east are limited by the vegetation immediately adjacent to the residential property. There are anticipated to be some partial views over the parkland trees towards the Business Park at Exeter International Airport from the highest parts of the residential property.

**Manor Cottages**

4.50 The residential properties at Manor Cottages are located immediately adjacent to the eastern boundary of the Rockbeare Manor estate and are afforded a high level of enclosure by the walls and vegetation that lines the eastern boundary of the Registered Park and Garden. Visual receptors within the residential properties have views to the north and west heavily limited by the existing visual screening. Some views over the adjacent agricultural land are available to the east and south for visual receptors within these properties although mature vegetation along the field boundaries means that the views are short in extent. The existing development at Exeter International Airport is screened from view for visual receptors in this location and there are no views of the Application Site. Due to the high levels of visual screening and enclosure, these properties will not be considered further in this assessment.

**Westcott House, Westcott Farmhouse and Little Westcott Farm**

4.51 The residential properties are located to the south of the busy A30 and its raised carriageway and are clustered around the junction of Westcott Lane and Rag Lane. Views to the north and north-west for visual receptors within these properties are heavily restricted by the route of the A30 carriageway and vegetation that lines it as well as the mature woodlands of the Rockbeare Manor estate. Views to the south are slightly more open and extend over the gently rolling farmland with hedgerows and tree belts. The woodland at Great Covert to the south-west forms the limit of views to the south-west. The existing development at Exeter International Airport and the Antiques Complex is well screened from view for receptors in the vicinity of these properties and so is the Application Site. Due to the high levels of visual screening for receptors in these residential properties, they are not considered further in this assessment.

**Shutebridge Farm and Beautiport Farm**

4.52 The residential properties in the vicinity of Beautiport Farm and Shutebridge Farm off Marwood Lane have views that are relatively well contained by the surrounding vegetation and farm buildings. Some filtered views over the adjacent farmland are available through the vegetation that lines the field boundaries, roads and watercourses. Where filtered views through the
vegetation and farm development are available, the woodland at Great Covert forms the extent of views to the north and the rising topography to the east means that views are generally short in extent. Similarly, rising topography limits the extent of views over the farmland to the south and plantation woodland forms a strong visual barrier for views to the west. Some partial views of the A30 carriageway and traffic moving along it are available to the north-west, through the vegetation.

Farringdon House

4.53 The residential properties of Farringdon House, The Lodge, Meadow Lodge and properties along The Drive are generally orientated to face south, with many views for visual receptors contained by the high levels of ornamental and parkland vegetation as well as the vegetation that forms field boundaries. Views to the north from the residential properties are limited to visual receptors within those along The Drive, where receptors have some filtered views over the adjacent farmland from the upper floor windows at the rear of the houses. Woodland vegetation at Farringdon Wood, Neather Mead Copse, Bridge Copse and the tree belts lining the B3184 form the extent of views.

4.54 The raised carriageway of the A30 is not visible for visual receptors within the properties or their curtilages due to the high level of intervening vegetation, and there are no views of any existing development in the vicinity of Exeter International Airport.

Spain Farm, Holwell Farm and Willow Farm

4.55 The three residential properties of Spain Farm, Holwell Farm and Willow Farm are located in a slight hollow in the land with views generally contained to short distance views over the adjacent agricultural land by the hedgerow field boundary and roadside vegetation. The extent of views for visual receptors within the properties and their curtilages is formed by the vegetation and topography in the vicinity of the three farmhouses and does not extend to include views of the A30 carriageway or any existing development at Exeter International Airport. Due to the limited visibility to the north for visual receptors within these residential properties, they will not be considered further in this assessment.

Marwood Cross

4.56 The residential properties at Marwood Cross are orientated in a southerly direction, facing towards Marwood Lane. Visual receptors within the residential properties have views generally contained to their residential curtilage by the ornamental and roadside hedgerow vegetation. Where views over the adjacent farmland are available, they are generally from the upper floor windows and focused over the farmland to the south. Some filtered views to the north are available but are short in extent due to the vegetation along the elevated carriageway of the A30. Traffic using the trunk road can be seen moving along the road but no existing development to the north of the carriageway is visible.

Wares Farm

4.57 Visual receptors within the residential property of Wares Farm have views over the surrounding landscape due to the slightly elevated location of the farmhouse. Views to the north from the property are partially restricted by the line of poplar trees along the B3184 but the elevated
carriageway of the A30 with traffic passing along it is visible in partial filtered views for receptors in the house and curtilage. Similarly, the overbridge of the B314 can be seen in views that extend to the existing development within the Business Park at Exeter International Airport and the new hotel building north of the A30. The A30 carriageway and vegetation that lines it screens any views of the Application Site.

_Clyst Honiton_

4.58 The residential settlement of Clyst Honiton is located approximately 2.5 km to the west of the Application Site and views for visual receptors at the residential settlement are relatively well contained by the topography of the surrounding land. Some longer views to the south are available as the topography falls away. The visual receptors within the properties and curtilages of Clyst Honiton are not afforded any views of the existing development at Exeter International Airport and no views of the Application Site due to the screening provided by foreground topography. As a result, visual receptors within these residential properties will not be considered further in this assessment.

_Clystlands_

4.59 The residential properties off Station Road and London Road at Clystlands are orientated to face in a variety of directions. Views for visual receptors within the residential properties are partially contained by the ornamental vegetation that occupies the residential gardens. Where views over the surrounding landscape are available, they are directed to the south-west, west and north by the local vegetation and landform that slopes down in a north-west direction. The mature hedgerow and tree vegetation that lines the carriageway of London Road sits on top of an earth bank that is elevated above the carriageway and further limits views to the south and south-east towards Exeter International Airport and the Application Site.

_Cranbrook_

4.60 The new residential settlements of Cranbrook contain a large number of recently developed residential properties as well as the older properties of South Whimple Farm and Treasbeare Cottages. The southernmost properties in the development allow visual receptors within the upper floors some views to the south towards the existing development at Exeter International Airport while other properties have views to the south screened by hedgerow vegetation on elevated ground along the B3174 London Road and the rising topography of the fields. The existing development at the Antiques Complex and the adjacent Application Site are not visible for visual receptors in these properties.

4.61 Views from the majority of the new residential properties would be limited by the adjacent properties or directed to the north as the landform falls away towards the railway line, allowing longer views over the gently undulating terrain of the Clyst Valley.

_Treasbeare Farm_

4.62 Treasbeare Farm is a residential property that is located approximately 1 km to the north-west of the Application Site. The farmhouse is orientated to face the south and focuses views of visual receptors within the property towards the existing development at Exeter International Airport. The views south extend over the existing development to the north of the airport runway and the
expansive element of the runway itself. The Antiques Complex that lies adjacent to the Application Site can be seen in views to the south-east with the recently ploughed land of the Application Site being visible amongst the trees along the hedgerow boundaries. Existing industrial scale development extends east across the view from the Business Park with the hotel building and the Antiques Complex forming clearly visible elements across the open view over the runway.

4.63 The Application Site can be seen well below the skyline in views where woodland and rising topography to the south of the A30 carriageway forms the extent of views.

Rockbeare

4.64 The village of Rockbeare and the development at Jack-in-the-Green along the A3174 London Road is a collection of mainly residential properties that are located around the junctions of Parsons Lane, Silver Lane and the B3174 as well as some unnamed local roads. The settlement is situated on a slight slope from the south up to the B3174, with the majority of the properties being on the lower flatter ground but a number of properties on the slightly higher land offering visual receptors within them longer views to the south. From these more elevated properties, the recently ploughed Application Site is visible in views over the agricultural land and parts of the Exeter International Airport runway to the south.

Roads

4.65 Receptors travelling in vehicles on roads have a low sensitivity to change as their attention may be focused on the road rather than visual amenity of their surroundings. The following section discusses the visual amenity for receptors on the roads that are considered most sensitive to change as a result of the proposed development.

Long Lane

4.66 Visual receptors travelling along Long Lane in vehicles generally have views channelled along the route of the road by the roadside hedgerow vegetation that limits views over the farmland either side of the lane to gaps in the hedgerows such as gateways as well as views over them where the land is slightly undulating. Visual receptors using the local road have close range views of the existing development at the Antiques Complex and the Business Park at Exeter International Airport where hedgerow vegetation allows. The Application Site is mainly screened from view by the boundary hedgerow of the field that lines Long Lane with the hedgerow trees forming recognisable visual elements.

A30

4.67 The main road of A30 passes to the south of the Application Site and carries traffic between Exeter and Honiton. The trunk road carries a high level of fast moving traffic in an east/west direction to the south of the Application Site where the road is slightly elevated above the surrounding land on an embankment that is lined by vegetation. Where views through the vegetation are available, visual receptors travelling along the trunk road in vehicles would have some transient views of the surrounding landscape, including views of the Application Site to the north as they pass it.
Silver Lane

4.68 Visual receptors travelling along the local road of Silver Lane in vehicles generally have views channelled along the route of the road by the roadside hedgerow vegetation that is often on hedgebanks. Views over the farmland either side of the lane are generally limited to gaps in the hedgerows such as gateways as well as views over them where the land is slightly undulating. Visual receptors passing along the local road have some views of the existing development at the Antiques Complex and the Business Park at Exeter International Airport where the foreground vegetation allows. The Application Site is only visible in a glimpsed view through gaps in the hedgerow as visual receptors pass along the winding country lane.

B3174 – London Road

4.69 The B3174 carries a relatively high level of traffic with views over the surrounding landscape generally screened by the roadside vegetation and development. Views are channelled along the route of the B-road although where the undulating topography allows, some longer views are available to the east and west. As visual receptors in vehicles on the B3174 pass to the north of the Exeter International Airport Runway, views to the south are limited and do not include the Application Site or the adjacent Antiques Complex.

Parsons Lane

4.70 Similarly, visual receptors travelling along the more local road of Parsons Lane as it travels almost parallel to the B3174, have the majority of views channelled along the route by the roadside vegetation. Where gaps in the vegetation allow views over the adjacent landscape, the B3174 on elevated ground forms the extent of views to the north. Where gaps in vegetation allow views to the south, the flat agricultural land occupies the transient glimpses. Views over the open farmland do not include the Application Site or the adjacent development at the Antiques Complex.

B3184

4.71 Visual receptors travelling along the B3184 to the east of the Business Park at Exeter International Airport have some views over the adjacent landscape where roadside vegetation allows but the majority of the route is lined by roadside hedgerows with some woodlands adding further visual containment. Where views to the north over or through the vegetation are available, the A30 embankment and vegetation along it generally forms the extent of views. Traffic travelling on the A30 can be seen filtered through the vegetation and, at some points, glimpsed views of the existing development to the north of the A30 such as the hotel building are available. The Application Site is screened from view for all but the A30 overbridge, where longer views from the elevated bridge are available.

Public Rights of Way

4.72 Visual receptors travelling on Public Rights of Way (PRoW) have a high sensitivity to changes in visual amenity. There are no public footpaths in the immediate vicinity of the Application Site, but a number of footpaths are located within the study area. The following section discusses the visual amenity for receptors on the PRoW that are considered most sensitive to change as a result of the proposed development.
Rockbeare Bridleway 8

4.73 Rockbeare Bridleway 8 is the closest PRoW to the Application Site and is located approximately 0.8 km to the east where it links the local road to Rag Lane travelling almost parallel to the A30. Visual receptors using the local route have views limited to their immediate foreground for the majority of the route by the woodland and vegetation on the northern side of the path and the well vegetated embankment of the A30 on the southern side of the path. Where receptors join the local road at the western end of the Bridleway, they have much more open views, including some views over the hedgerow on the northern side of the path and into the field. Views west, over the hedgerow, extend over the adjacent pasture fields and their hedgerow boundaries with the hedgerow trees forming the extent of views, although Lower Southwood Farm is partially visible in filtered views. There are no views of the Application Site from the Bridleway.

Aylesbeare Footpath 4 and Rockbeare Footpath 7

4.74 Aylesbeare Footpath 4 lies approximately 1 km to the south-east of the Application Site where it joins Rockbeare Footpath 7 to link Marwood Lane and Rag Lane. The majority of views for visual receptors passing along these local routes are limited by the high level of vegetation that forms the field boundaries around Shutebridge Farm and the woodland of Great Covert. Where the footpath passes through open fields, some longer views over the landscape are available. The raised embankment of the A30 and vegetation that lines it forms a visual barrier for many views to the north and north-west, meaning that there are no views of the Application Site available for visual receptors using these routes.

Aylesbeare Footpath 7

4.75 The local footpath lies approximately 1.2 km to the south-east of the Application Site and links Marwood Lane with the Unnamed Road to the north. Visual receptors using the footpath have some views over the open fields but hedgerow and tree belt vegetation forms the extent of views and maintaining relatively short distance visual envelopes. The high level of vegetation around Shutebridge Farm and Great Covert means that views to the north-west are limited and visual receptors do not have any visibility of the Application Site.

Rockbeare Footpath 1

4.76 Rockbeare Footpath 1 is located approximately 1.7 km to the north of the Application Site and links the B3174 to the village of Rockbeare. The footpath traverses the sloping ground up to the B3174 and allows visual receptors using it some longer views to the south (see Viewpoint 1).

Aylesbeare Footpath 1 and Footpath 10

4.77 The two local footpaths are located approximately 1.8 km to the south-east of the Application Site and cross the farmland to the west of the small settlement of Aylesbeare. Views for visual receptors using the footpaths are relatively well contained within the fields by the mature hedgerow vegetation that forms the boundaries. Where the existing development on the Business Park at Exeter International Airport is visible in views over and through vegetation, they are minor components in the view and the existing development at the Antiques Complex is not perceptible. The Application Site is not visible and the high level of visual screening means that views from these footpaths are not considered further in this assessment.
Commercial Premises

4.78 Visual receptors within commercial premises have a low sensitivity to changes in visual amenity as their attention would be focused upon the activities they are undertaking for their job. The following section discusses the visual amenity for receptors in commercial premises that are considered most sensitive to change as a result of the proposed development.

Antiques Complex

4.79 Visual receptors within the numerous commercial premises at the Antiques Complex have some short views over the surrounding farmland where the vegetation and adjacent commercial units do not limit views to the immediate foreground. The industrial elements of the Business Park at Exeter International Airport can be seen in views that extend to the west and other airport development features in views out to the north where they are available. Visual receptors in the easterly most units have some views over the adjacent landscape and the Application Site although views for receptors within many of the units are contained (see Viewpoint 9).

Exeter International Airport Business Park

4.80 Views for visual receptors at commercial units within the Business Park at Exeter International Airport are generally focused to the north and over the runway. Views towards the Application Site are available from the Hotel and the FlyBe Training Centre that are located on the south-eastern edge of the Business Park. However, the existing development at the Antiques Complex screens views of the Application Site. The trees that line the southern boundary of the Application Site can be seen in oblique views that feature the existing development amongst farmland.

Representative Viewpoints

4.81 A number of representative viewpoints have been selected to demonstrate the visual baseline for the local area. These viewpoints are intended to be representative of the type of views available for those receptors that are likely to be most affected by the proposed development. Additional Context Photos that show views from more distant locations are contained within Appendix 4.2. The locations of the viewpoints are shown on Figure 4.5 while the viewpoints themselves can be seen on Figure 4.6.

Viewpoint 1: Rockbeare Footpath 1, 1.8 km North of the Application Site

4.82 Views south from the short local route of Rockbeare Footpath 1 extend over the pasture of the foreground and into the agricultural land that occupies the flatter ground on a lower AOD. The fields are divided by hedgerows with occasional hedgerow trees that filter the longer views and merge to appear as a block of woodland. As land rises beyond the A30, it forms the extent of views. The existing development at the Antiques Complex can be seen when searched for in the view but the Application Site is not a recognisable feature.

4.83 Views are drawn towards the existing development in the foreground that makes up the settlement of Rockbeare and the ornamental vegetation that surrounds it.
Viewpoint 2: Rockbeare Recreation Ground, 1.3 km North-West of the Application Site

4.84 Visual receptors within the recreation ground on the southern side of Rockbeare have some views over the hedgerows that form its boundaries. The extent of views to the north and east are formed by the existing residential development of Rockbeare. Views to the south are limited in extent by the gently undulating topography with vegetation and telegraph poles immediately south of the recreation ground forming the extent of views. There are no views of the Application Site or the Antiques Complex adjacent to it.

Viewpoint 3: Silver Lane at Higher Southwood Farm, 180 m East of the Application Site

4.85 Views of the agricultural land adjacent to the local road of Silver Lane are available over the low hedgerows that line it as the gently undulating topography rises away from the road. Hedgerow trees that form the southern and western boundaries of the Application Site are visible against the backdrop of the sky in the rural views that are short in extent. The Application Site is not visible due to the gently undulating topography but the hedgerow that forms its eastern boundary can be seen along the horizon. Similarly, there are no views of the existing development at the Antiques Complex. Telegraph poles and wires add a slight level of clutter to the disturbed land around the farm track on the corner of Silver Lane.

Viewpoint 4: Long Lane West of Junction with Silver Lane, 170 m East of the Application Site

4.86 Views for visual receptors in this vicinity are generally channelled along the road by hedgerows that line either side of the country lane and form the field boundaries for the arable fields either side. The mature hedgerow trees that line the road further add to the way that views are drawn along the road, although some views are available over the hedgerows. There are no views of the Application Site due to the rising topography but the hedgerow that forms the eastern boundary of the Application Site is visible in views to the west. The existing development at the Antiques Complex is screened from view by the gently undulating topography of the intervening land.

Viewpoint 5: A30 Overbridge, 900 m East of the Application Site

4.87 Views for visual receptors on the elevated location of the A30 overbridge and the ramps up to it extend over the surrounding vegetation to allow some longer range views of the wider landscape. Vegetation on the embankments partially screen some views to the north and prevent any views into the Rockbeare Manor Estate. Views to the west extend a long way over the foreground vegetation and mature trees at Lower Southwood Farm. The existing development on the edge of Exeter International Airport can be seen in views that extend towards the edge of Exeter. A small part of existing development at the Antiques Complex can be seen amongst the mature vegetation beyond the recently ploughed Application Site that can be seen through the vegetation while foliage levels are low.

Viewpoint 6: Marwood Lane, 440 m South of the Application Site

4.88 Views from Marwood Lane are generally channelled along the route of the road with some views over the land to the north and south. Where views over the hedgerows that line the road are available, they can extend long distances where the rolling topography and local vegetation allows, but are generally short in extent. Views north through and over the roadside hedgerow
include the carriageway and traffic of the A30 with some views of elements beyond through the intervening vegetation. The existing development at Exeter International Airport such as the Hotel and FlyBe Training Centre can be made out but the existing development at the Antiques Complex is screened from view by vegetation to the south of the A30. The extent of views is formed by the elevated topography of the Clyst Valley to the north.

**Viewpoint 7: Long Lane at South-Eastern Corner of the Application Site**

4.89 Visual receptors travelling along the local road of Long Lane in this location have views generally channelled along the lane by the roadside hedgerows and hedgerow trees. Where views over the hedgerows and into the arable land either side are available, they extend south to the A30 and longer distances over the Application Site to the north and north-west. The large mature hedgerow trees that line the road and other field boundary hedgerows in the vicinity of the Application Site form a noticeable part of the views with the existing units of the Antiques Complex featuring amongst them. Airport development and farm buildings to the north of the airport runway at Treasbeare Farm can be seen over the Application Site in longer views where the facing slopes of the Clyst Valley form the extent of views.

**Viewpoint 8: Long Lane at South-Western Corner of the Application Site**

4.90 Views are channelled along the length of the road by the roadside vegetation with the mature hedgerow trees adding to the focus of views along the road. Visual receptors on this section of the local road have limited views over the surrounding landscape but the lower hedgerow on the southern side of the road allows some views to the south that extend over the carriageway of the A30 and the traffic that can be seen passing along it. The hedgerow along the northern side of the road forms a visual screen to views north, preventing visual receptors from having any visibility of the Application Site in this location.

**Viewpoint 9: Antiques Complex off Long Lane, 192 m West of the Application Site**

4.91 Views from the centre of the Antiques Complex are limited in extent by the existing development as well as vegetation that is remnant of an old field boundary hedgerow with mature hedgerow trees. Views for the majority of visual receptors are contained to the business units while some views from those on the edges extend into the adjacent landscape where vegetation allows.

**Viewpoint 10: Business Park at Exeter International Airport, 750 m West of the Application Site**

4.92 Visual receptors on the eastern edge of the Business Park and Hotel have views to the east over the unused land and agricultural farmland as well as the hedgerow field boundaries and woodlands. The existing development at the Antiques Complex to the east is partially visible amongst the vegetation that surrounds it as the topography slopes gently up. Woodland at Rockbeare Manor Estate is partially visible over the existing development and vegetation at the Antiques Complex. The Application Site is entirely screened from view.

**Viewpoint 11: A30 Overbridge on the B3184, 1 km South-West of the Application Site**

4.93 The foreground of views from the elevated location of the overbridge is dominated by the A30 and associated infrastructure, with the large industrial units of the Business Park and Hotel to the north of the carriageway. Existing development at the Antiques Complex can be seen in
conjunction with the industrial units of the Business Park. The roadside vegetation adds to the channelling of views along the road corridor while some views extend beyond the foreground and the woodland of Rockbeare Manor Estate towards the hills beyond in the north-east. The Application Site is not visible due to the screening provided by existing elements in the fore and middle ground.

**Design Proposals**

**Scheme Description**

4.94 The proposal comprises a High Voltage Direct Current (HVDC) converter station to convert electricity from Direct Current (DC) to Alternating Current (AC) and vice-versa depending on the direction of power flow. Full details of the proposal are available in Chapter 2: Project Description. The majority of this equipment is housed in two large sheds, one for each monopole. One or two smaller buildings will house the control systems and other minor system as well as a mess room and offices for site staff. The buildings are typically constructed with steel frames and will typically be clad in pre-coloured aluminium sheet.

4.95 The Application Site proposed for the converter station is immediately south east of Exeter Airport on Long Lane near Rockbeare. The total area of the development site is 4.99 hectares. Immediately to the west is an additional area of 2.0 hectares that will be used by construction contractors for site offices, staff parking and materials laydown area.

4.96 The site has a gradual slope from the south-east corner to the north-west corner, of approximately 4 m in total. In order to prepare a level area for construction of the converter station topsoil will be removed and a cut and fill operation performed. The total volume of the cut and fill will be a maximum of 40,000 m$^3$ i.e. 40,000 m$^3$ to be moved from one location to another. It is expected that the majority of disturbed material will be retained on site and used for landscaping purposes.

4.97 The access route to the site for both construction and operational purposes will be from the A30 Clyst Honiton junction, east along the B3182, left onto Long Lane adjacent to the entrance to Exeter Airport and along Long Lane. Some widening works will be required to Long Lane within the Highway boundary to accommodate the abnormal loads (transformers) and general construction traffic.

**Design and Siting**

4.98 The layout of buildings and equipment shown in Figures 2.3 and 2.4 are illustrative only and show the types of infrastructure to be provided, the maximum parameters for the development within two possible layouts on the site relevant to the HVDC technology that might be provided.

4.99 The converter station is likely to have two halls of up to 20 m in overall height and with an operational footprint of up to approximately 11,000 m$^2$ which will house the semi-conductor valves used to convert:

- DC current to AC current, a process called ‘inverting’; and
AC current to DC current, a process called ‘rectifying’.

4.100 The valve halls will be served by a cooling system which dissipates heat via a water circulation system of pumps and fans to the outside air as well as building air-conditioning. Similar to a conventional substation, the converter station site will have external plant and equipment in the form of 400kV transformers, switchgear and bus bars together with smaller buildings which will house control systems as well as facilities for maintenance staff.

4.101 Two new accesses will be created off Long Lane to allow incoming traffic to be separated from vehicles leaving the site. The inbound access junction will be designed in such a way as to avoid the need for vehicles to wait on Long Lane before being admitted. Additional passing places will be installed at intervals along Long Lane within the highway boundary between the site and the airport industrial estate to enable oncoming vehicles to pass each other safely. A small number of parking spaces would be provided on site for the operational staff.

4.102 The site will be fenced and monitored with security cameras and lighting. The lighting will be designed to avoid illumination of areas beyond the operational site.

4.103 The exterior of the buildings would be clad in a grey colour and boundary fences would be either green or grey.

**Landscaping and Mitigation Proposals**

4.104 A scheme of landscaping will be provided comprising of land shaping and woodland planting to soften the external appearance of the site. Landscaping is also to be reserved for later approval but it has been possible to demonstrate the concept in response to the illustrative layouts (see Figures 2.7 and 2.8)

4.105 The landscape proposals include the following features:

- Protection and retention of existing vegetation on adjacent land as an important landscape framework for the proposals.
- Shrub planting in the western section of the Application Site to complement existing vegetation and enhance screening for visual receptors on Fareham.
- Native planting to provide a scheme of landscape and ecological value.

4.106 The landscape proposals have been designed as an integral part of the proposed development, to provide a screening buffer for visual receptors that are likely to witness effects as a result of the proposed development.

4.107 These design objectives would connect the different features and characteristics of the local area and integrate the new character of the energy infrastructure scheme.

**Assessment of Landscape and Visual Effects during Construction**

4.108 Construction activities associated with the proposed energy infrastructure development would occur on the Application Site and Temporary Construction Area and would include the following;
• Erection of tree protection fencing and hoardings.
• Stripping and stockpiling of soil materials.
• Construction of buildings including erection of crane.
• Construction of hardstanding, roads and parking area.
• Installation of energy infrastructure.
• Erection of security fences and gates.
• Installation of Tree Protection measures.
• Construction plant equipment and materials storage.
• Site offices and car park.
• Planting and grass seeding operations.

4.109 The construction phase would last for approximately 34 months or 2.8 years. Construction works would be during daylight hours but security lighting would be required on the Application Site and Temporary Construction Area. Consideration of the likely landscape and visual effects include both the Application Site and the Temporary Construction Area.

Landscape Effects

National Character Area Profile

4.110 The short term construction phase of the proposed development would introduce an additional level of activity to the large NCA of Devon Redlands which is already heavily influenced by industrial development and significant communication corridors as well as the large landscape influence of Exeter International Airport.

4.111 The Airport, M5 motorway, the A30 trunk road and the West of England Main Line all combine to provide national scale communication routes that exhibit an existing level of movement and disturbance that the temporary construction activities would take place amongst. Construction activities would comprise some excavation works and some elevated activities on farmland between the A30 carriageway and Exeter International Airport runway.

4.112 The construction activities would not be large scale enough to materially affect the character of the large NCA and would not compromise the characteristic hilly landscape, steep sided river valleys, large woodlands, cliffs or ridgelines. The construction activities would not alter the distinctive vernacular of red sandstone buildings or landscape setting of the Haldon Ridge.

4.113 The proposed development would cause a small change to the character of the National Character Area 148: Devon Redlands, which has a medium sensitivity to change. This would result in a minor adverse effect upon the NCA.
Devon’s Landscape Character Assessment

4.114 Construction operations for the proposed development would take place within Landscape Character Type 3E: Lowland Plains, within the Clyst Lowland Farmlands Character Area. The temporary construction phase of the proposed development would increase the level of activity and movement around the Application Site within the Character Type that exhibits a high level of disturbance from the transport corridors, Exeter International Airport and Business Park already reducing the tranquillity of this part of the Lowland Plains.

4.115 The construction works would not compromise the characteristic elements of the Character Type such as Orchards, Historic Parkland, pattern of villages along watercourses or the cob and thatch vernacular.

4.116 The temporary construction phase of the proposed development would occur within an area of the Character Type that already exhibits a low tranquillity and is heavily influenced by the existing disturbance cause by Exeter International Airport, industrial development and transport corridors. The construction works on the Application Site and Temporary Construction Area would cause a small change to the Lowland Plains. This would result in a minor adverse effect upon the medium sensitivity Character Type.

Local Landscape

4.117 The construction activities on the Application Site and Temporary Construction Area would increase the level of activity in the local area and would modify the current uses of the farmland to construction site and compound. The relatively flat terrain of the Application Site would be excavated in order to install foundations while cut and fill operations would create a flat site with embankments in the northern section and cuttings in the southern area. The use of cranes and elevated construction activities would be uncharacteristic of the Application Site, but not the local area where recent development at the Business Park to the west and some of the storage units at the Antiques Complex mean that elevated activities are not entirely out of place in the local area.

4.118 The majority of boundary features would remain in place for the duration of the construction phase although there would be a small amount of hedgerow removed to provide access. The mature hedgerow trees would remain unaffected by the construction activities.

4.119 The tranquillity of the Application Site would be further reduced by the direct actions of the construction activities. The existing disturbance from Exeter International Airport and the existing development at the Antiques Complex provide a level of disturbance in the local area but the Application Site would be modified from farmland to a construction site, reducing the level of tranquillity that it exhibited. Night time lighting for security would further reduce the tranquillity of the local area during the construction phase of the proposed development.

4.120 Construction activities would cause a large change to the character of the Application Site and Local Landscape that would result in a major adverse effect due to the medium sensitivity to change that the Application Site and surrounding area exhibit.
Designated Landscapes

4.121 The temporary construction activities on the Application Site would not cause any direct changes to the character of Rockbeare Manor Grade II Registered Park and Garden. The construction works would be separated from the main area of the parkland by the landscape buffer that the plantation woodland on the western edge provides as well as the farmland on the intervening land. The construction activities and night time security lighting would slightly contribute to a further reduction in tranquillity due to the movement and noise at the Park and Garden and would cause a negligible change to the character of the designated landscape. This would result in a minor adverse effect upon Rockbeare Manor.

Visual Effects

Residential Properties

Antiques Complex

4.122 The visual receptors at the residential properties within the Antiques Complex would have the majority of the temporary construction phase for the proposed development screened from view by the existing vegetation and development to the east. Some parts of the elevated activities may appear as visible above the existing vegetation and development to the east of the properties. Similarly, activities on the Temporary Construction Area would be partially visible in some filtered views through the hedgerow vegetation. The temporary construction phase of the proposed development would cause a small change to views where the construction activities are visible due to the high level of screening by the existing vegetation and development as well as the existing disturbance witnessed on intervening land. This would result in a moderate adverse effect upon the high sensitivity receptors.

4.123 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the high sensitivity visual receptors at the Antiques Complex. This would result in a moderate adverse effect.

Higher Southwood Farm

4.124 The majority of the construction activities on the Application Site would not be visible for visual receptors within the residential property at Higher Southwood Farm. The foreground screening provided by farm buildings adjacent to the residential property means that visibility of the activities on the Application Site and any construction work would be limited.

4.125 Views to the north would remain the main focus of visual receptors within the residential property and its curtilage. While there might be some visibility of the more elevated works over farm buildings and construction traffic on local roads, the majority of the temporary construction phase would be screened from view. The construction works would cause a negligible change to views for visual receptors at Higher Southwood Farm. This would result in a minor adverse effect upon the high sensitivity receptors.

4.126 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors at Higher Southwood Farm. This would result in a minor adverse effect.
Lower Southwood Farm

4.127 The construction works on the Application Site and Temporary Construction Area would be partially visible in views for visual receptors at the residential property of Lower Southwood Farm. The views west from the upper floor side window on the western elevation of the property would feature elements of the construction works in views that are filtered by trees. The main focus of views would remain into the gardens to the south. Where the construction works feature in views, they would be seen in front of the existing development at the Antiques Complex and the mature hedgerow trees.

4.128 The construction works of the proposed development would cause a Small change to views from a side window of the residential property and would not alter the focus of views from the property. This would result in a moderate adverse effect upon the high sensitivity receptors within the property.

4.129 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the high sensitivity visual receptors at Lower Southwood Farm. This would result in a moderate adverse effect.

Woodhouse Farm

4.130 The construction works on the Application Site would be seen in oblique views for visual receptors within the residential property and curtilage at Woodhouse Farm. The operations on the Application Site would occupy a small part of the overall view from the property where views west over the airport runway and surrounding fields would remain the focus of vistas. The large scale development at the Business Park of Exeter International Airport provides an element of disturbance in the rural views.

4.131 Elevated works would appear as the most visible elements from Woodhouse Farm but would be seen against a backdrop of mature vegetation. The construction activities would not change the context of views but would cause a minor change to visual amenity that would result in a moderate adverse effect upon the high sensitivity receptors at Woodhouse Farm.

4.132 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the high sensitivity visual receptors at Woodhouse Farm. This would result in a moderate adverse effect.

4.133 Similarly, the construction activities would cause a minor change to views from the three residential properties on Silver Lane to the south of Woodhouse Farm. This would result in a moderate adverse effect upon the high sensitivity receptors in these properties.

4.134 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the high sensitivity visual receptors at the three residential properties on Silver Lane to the south of Woodhouse Farm. This would result in a moderate adverse effect.

Rockbeare Manor

4.135 Visual receptors at Rockbeare Manor would have limited visibility of the construction works although the most elevated activities may be visible from the very upper parts of the residential
property. Where visible, the construction activities would be seen within the context of views towards Exeter International Airport and the Business Park adjacent to it. Where the temporary construction phase of the proposed development is visible from Rockbeare Manor, it would cause a negligible change to views that would be focused on the Parkland. This would result in a minor adverse effect upon the high sensitivity receptors.

4.136 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors at Rockbeare Manor. This would result in a minor adverse effect.

Shutebridge Farm and Beutiport Farm

4.137 Visual receptors within these residential properties and their curtilages would have all views of the ground level and low level construction operations screened from view by the vegetation in the fore and middle ground. Some partial views of the more elevated construction activities may be available during the temporary construction phase of the proposed development. Where the more elevated activities on the Application Site form visible elements from the vicinity of Shutebridge Farm and Beutiport Farm, they would be a minor component of the rural views and would be easily missed amongst the high level of vegetation around the fields. The temporary construction works would cause a negligible change to views that the high sensitivity receptors witness. This would result in a minor adverse effect.

4.138 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors at Shutebridge and Beutiport Farm. This would result in a minor adverse effect.

Farringdon House

4.139 Due to the existing levels of visual screening provided by vegetation on the intervening land, the majority of temporary construction activities on the Application Site would be screened from view for the various visual receptors at the residential properties around Farringdon House. The most elevated construction activities on the Application Site may be partially visible above the vegetation in views to the north but would not form a noticeable part of the view. The temporary construction activities on the Application Site would cause a negligible change to views for visual receptors in the residential properties of Farringdon House, The Lodge, Meadow Lodge and properties along The Drive. This would result in a minor adverse effect upon the high sensitivity receptors.

4.140 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors at and around Farringdon House. This would result in a minor adverse effect.

Marwood Cross

4.141 The temporary construction works at the Application Site would be mainly screened from view by the vegetation to the north and elevated section of A30 carriageway would screen the majority of construction activities from view. The more elevated activities on the Application Site such as cranes would be seen above the vegetation and landform to the north. The elevated construction works would be seen in the context of the moving traffic on the elevated A30 and would cause a
small change to views north. This would result in a moderate adverse effect upon the high sensitivity visual receptors.

4.142 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the high sensitivity visual receptors at Marwood Cross. This would result in a moderate adverse effect.

**Wares Farm**

4.143 Visual receptors within the residential property and curtilage at Wares Farm would have some partial views of the temporary construction activities on the Application Site. The majority of the construction activities would be screened from view by the intervening vegetation and development but some of the more elevated activities may be visible in views to the north-east for visual receptors at the property. Views over the elevated section of the A30 and vegetation that lines it would include partial elements of the elevated construction activities but would not change the character of views from the residential property. The temporary construction operations would cause a negligible change to views from Wares Farm due to the intervening elements. This would result in a minor adverse effect upon the high sensitivity visual receptors.

4.144 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors at Wares Farm. This would result in a minor adverse effect.

**Clystlands**

4.145 The construction work on the Application Site would be mainly screened from view for visual receptors within residential properties and their curtilages off Station Road. Where receptors have longer views from the upper floor windows, the more elevated temporary construction operations may be visible in oblique views to the south-east. The construction phase of the proposed development would not form a noticeable part of views for visual receptors in these properties and would be mainly screened by intervening elements. Where activities on the Application Site can be seen from these properties, they would cause a negligible change to views. This would result in a minor adverse effect upon the high sensitivity receptors.

4.146 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors at Clystlands. This would result in a minor adverse effect.

**Cranbrook**

4.147 The temporary construction phase of the proposed development would be mainly screened from view for the visual receptors on the southern edge of the recent development at Cranbrook as well as the more established properties of South Whimple and Treasbeare Cottages. The majority of the construction operations would be screened from view by the intervening topography but where views of the most elevated activities are available, they would be seen within the context of Exeter International Airport and associated development. The temporary construction phase of the proposed development would cause a negligible change to views for the high sensitivity receptors. This would result in a minor adverse effect.
4.148 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors at Cranbrook. This would result in a minor adverse effect.

Treasbeare Farm

4.149 Some partial views of the construction operations adjacent to the existing development at the Antiques Complex would be available during the temporary construction phase of the proposed development. Construction works on the Application Site would not extend the existing disturbance in the view as the airport runway extends east beyond the Application Site. Activities on the Application Site and Temporary Construction Area would be visible in views to the south-east from the property and curtilage of Treasbeare Farm but would not appear above the skyline and would not alter the character of the views.

4.150 The construction phase of the proposed development would introduce an added element of disturbance to the views that visual receptors in the residential property and curtilage have to the south-west. Construction operations would cause a small change to the already disturbed view from Treasbeare Farm. This would result in a moderate adverse effect upon the high sensitivity receptors.

4.151 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the high sensitivity visual receptors at Treasbeare Farm. This would result in a moderate adverse effect.

Rockbeare

4.152 The majority of the construction activities would be screened from view for visual receptors in the residential properties that make up the settlement of Rockbeare by vegetation on the intervening land. The relatively low lying intervening land allows for some wide but short distance vistas that mean the ground and low level construction works would be screened from view. The more elevated activities may appear in the some views to the south above the vegetation and gently undulating topography in views. The temporary construction works would cause a negligible change to views for visual receptors within the residential properties as they would not alter the character of views to the south. This would result in a minor adverse effect upon the high sensitivity receptors.

4.153 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors at Rockbeare. This would result in a minor adverse effect.

Roads

Long Lane

4.154 Visual receptors travelling along Long Lane would have some close range views of the temporary construction activities taking place on the Application Site and Temporary Construction Area. Ground level activities would be screened from view for much of the road and only partial views of work available but clear views of construction works would be gained from some sections of
the road. Although the construction works would not interrupt any key views, they would occupy large areas of the oblique views north as vehicles pass the Application Site.

4.155 Due to the close range views that transient receptors would receive as they pass along Long Lane, the temporary construction phase of the proposed development would cause a large change to views that already include large industrial buildings at the Business Park around Exeter International Airport. This would result in a moderate adverse effect upon the low sensitivity receptors.

4.156 Night time security lighting of the Application Site and Temporary Construction Area would cause a large change to the night time views for the low sensitivity visual receptors on the road. This would result in a moderate adverse effect.

A30

4.157 The temporary construction activities on the Application Site would be partially visible in oblique views as visual receptors travel along the elevated section of the A30. Views to the north through gaps in the roadside vegetation would feature the construction work but would only be visible for a very short section of the route where existing industrial scale development is already visible such as that at Exeter International Airport Business Park.

4.158 The temporary construction activities for the proposed development would cause a small change to views from the A30 carriageway where existing development around the airport and runway provide an existing level of clutter in oblique views north. This would result in a negligible adverse effect upon the low sensitivity visual receptors travelling on the elevated section of road.

4.159 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the low sensitivity visual receptors on the road. This would result in a negligible adverse effect.

Silver Lane

4.160 Construction activities on the Application Site would be screened from view for much of the route by the roadside vegetation and hedgebanks for visual receptors travelling along the local road. However, there are a small number of locations that allow views over the wider landscape such as gateways and locations where the land undulates and the temporary construction phase of the proposed development would be visible. The elevated construction activities would be visible for visual receptors in this small number of locations while the ground level operations would generally be screened from view by landform and vegetation. The construction phase of the proposed development would cause a large change to the closest views where transient receptors have visibility of the activities straight on. This would result in a moderate adverse effect upon the low sensitivity receptors using Silver Lane.

4.161 Night time security lighting of the Application Site and Temporary Construction Area would cause a large change to the night time views for the low sensitivity visual receptors on the road. This would result in a moderate adverse effect.
B3174 – London Road

4.162 The temporary construction operations on the Application Site and Temporary Construction Area would not be visible for visual receptors travelling along the B3174. Vegetation, existing development and landform of the immediate foreground and intervening land would provide sufficient visual screening to prevent the construction works from being visible in oblique views. The construction phase of the proposed development would not cause any changes to views and would not result in any effects upon the low sensitivity visual receptors.

Parsons Lane

4.163 Visual receptors travelling along the local road of Parsons Lane would have some glimpsed oblique views of the most elevated construction activities on the Application Site. The roadside hedgerows would prevent views of the temporary construction phase of the proposed development for much of the route. Where the construction phase activities are visible, they would not form a noticeable element in views and would not alter the context of views for receptors using the road. The temporary construction phase of the proposed development would cause a negligible change to views. This would result in a negligible adverse effect upon the low sensitivity receptors.

4.164 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the low sensitivity visual receptors on the road. This would result in a negligible adverse effect.

B3184

4.165 The temporary construction phase of the proposed development would be screened from view for much of the route of the B3184 by screening provided by foreground development, vegetation and landform. Construction activities on the Application Site would be partially visible in a small number of glimpsed oblique views as the transient receptors pass along the route where only the more elevated works would be seen. The construction activities would cause a medium change to views for visual receptors travelling along the B3184 and would not form a prominent element in the oblique views. This would result in a minor adverse effect upon the low sensitivity receptors.

4.166 Night time security lighting of the Application Site and Temporary Construction Area would cause a medium change to the night time views for the low sensitivity visual receptors on the road. This would result in a minor adverse effect.

Public Rights of Way

Rockbeare Bridleway 8

4.167 The temporary construction phase of the proposed development would be screened from view for visual receptors on the majority of the route by foreground vegetation, with the exception of the very western section. The ground and lower level construction works would be screened from view for visual receptors on the Bridleway by the intervening vegetation but some more elevated construction activities may be visible above the trees to the west. Where the elevated construction works are visible above the vegetation on intervening land, they would not be
obvious elements in the view and would only have the potential to be seen for a short duration by the transient receptors. The construction phase of the proposed development would cause a negligible change to views for the high sensitivity receptors. This would result in a minor adverse effect.

4.168 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors on the footpath. This would result in a minor adverse effect.

_Aylesbeare Footpath 4 and Rockbeare Footpath 7_

4.169 Some views of the construction phase of the proposed development would be available above the existing vegetation on the intervening land for visual receptors using the local footpaths of Aylesbeare Footpath 4 and Rockbeare Footpath 7. Many views of construction works from the paths would be screened by foreground vegetation but where longer views over the open fields are available, the more elevated activities on the Application Site may form part of the vistas. Where the construction works are visible, they would form very minor components in the view and would not affect the rural character of the local footpaths. The temporary construction works on the Application Site would cause a negligible change to views north. This would result in a minor adverse effect upon the high sensitivity receptors using the short distance paths.

4.170 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors on the footpath. This would result in a minor adverse effect.

_Aylesbeare Footpath 7_

4.171 Similarly, the visual receptors travelling along the local route of Aylesbeare Footpath 7 would have no views of the ground and low level activities during the temporary construction activities on the Application Site. Where longer views to the north are available and not prevented by foreground vegetation, some of the more elevated construction activities may be visible when searched for by the receptors. The temporary construction phase of the proposed development would cause a negligible change to views north from the local footpath as the construction works would not be noticeable. This would result in a minor adverse effect upon the high sensitivity receptors using the short distance route.

4.172 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors on the footpath. This would result in a minor adverse effect.

_Rockbeare Footpath 1_

4.173 The effects of the temporary construction phase of the proposed development upon visual receptors using Rockbeare Footpath 1 are considered at Viewpoint 1.

Commercial Premises

_Antiques Complex_

4.174 The temporary construction phase of the proposed development would be seen in views from the eastern units at the Antiques Complex by visual receptors. Views for receptors in the eastern
units would include close range visibility of the temporary construction activities on both the Application Site and the Temporary Construction Area. However, there would be no change to visual amenity for visual receptors in many of the commercial units at the Antiques Complex due to the screening provided by other buildings immediately adjacent to them. Where close range views of the construction activities are available, they would cause a large change to views at the commercial premises. This would result in a moderate adverse effect upon the low sensitivity receptors.

4.175 Night time security lighting of the Application Site and Temporary Construction Area would cause a large change to the night time views for the low sensitivity visual receptors at the Antiques Centre. This would result in a moderate adverse effect.

4.176 The effects upon views from publicly accessible parts of the Antiques Complex are discussed at Viewpoint 9.

Exeter International Airport Business Park

4.177 Construction activities on the Application Site would only be partially visible from a small section of the Business Park on the eastern edge due to the majority of views being contained by adjacent units. Where views to the east are available for visual receptors at the Business Park, the ground level construction activities on the Application Site would be screened from view by the existing vegetation, development and local topography. However, the more elevated activities of the temporary construction phase would be partially visible above the existing development at the Antiques Complex in views to the east. The temporary construction phase of the proposed development would cause a medium change to the views east available from the eastern edge of the Business Park. This would result in a minor adverse effect upon the low sensitivity receptors within the commercial buildings.

4.178 Night time security lighting of the Application Site and Temporary Construction Area would cause a medium change to the night time views for the low sensitivity visual receptors the commercial premises. This would result in a minor adverse effect.

Representative Viewpoints

Viewpoint 1: Rockbeare Footpath 1, 1.8 km North of the Application Site

4.179 The majority of the construction activities would be screened from view for visual receptors on the short distance footpath by vegetation on the intervening land. The relatively low lying farmland to the south of the footpath allows for some wide but short distance vistas that mean low level construction works would be screened from view. The more elevated activities may appear in some views to the south above the vegetation and gently undulating topography. The temporary construction works would cause a negligible change to views for visual receptors within the residential properties as they would not alter the character of views to the south. This would result in a minor adverse effect upon the high sensitivity receptors.

4.180 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the high sensitivity visual receptors on the footpath. This would result in a minor adverse effect.
Viewpoint 2: Rockbeare Recreation Ground, 1.3 km North-West of the Application Site

4.181 The temporary construction phase of the proposed development would be almost entirely screened from view for visual receptors at the Rockbeare Recreation Ground due to the vegetation and gently undulating topography that limit views to the south. Some elevated construction works on the Application Site may appear in views south above the vegetation that forms the current extent of views but would not be an obvious component of the vista. The temporary construction phase of the proposed development would cause a negligible change to views that receptors witness from the Rockbeare Recreation Ground. This would result in a negligible adverse effect upon the low sensitivity receptors using the recreational facilities and a minor adverse effect on any visual receptors within the residential properties along the northern edge.

4.182 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views and would result in a negligible adverse effect upon the low sensitivity visual receptors in the recreation ground and a minor adverse effect upon the high sensitivity receptors in properties adjacent to it.

Viewpoint 3: Silver Lane at Higher Southwood Farm, 180 m East of the Application Site

4.183 Visual receptors passing along this section of Silver Lane would have some clear views of the temporary construction phase of the proposed development over the agricultural field to the south-west. The construction activities on the Application Site would be visible above the hedgerow that forms the eastern boundary of the Application Site and would be noticeable as the receptors pass along the local road of Silver Lane. The temporary construction phase of the proposed development would cause a large change to views from this section of the road and would result in a moderate adverse effect upon the low sensitivity visual receptors on it.

4.184 Night time security lighting of the Application Site and Temporary Construction Area would cause a large change to the night time views for the low sensitivity visual receptors on the road. This would result in a moderate adverse effect.

Viewpoint 4: Long Lane West of Junction with Silver Lane, 170 m East of the Application Site

4.185 The construction works would be partially visible to visual receptors on this section of Long Lane during the temporary construction phase of the proposed development. Views along the length of the road would include the construction operations to the north-west. The temporary construction operations would draw views away from the mature trees that line the road and would be noticeable for visual receptors. The construction activities on the Application Site would add clutter and disturbance to this section of the route and would cause a large change to views for the low sensitivity visual receptors. This would result in a moderate adverse effect.

4.186 Night time security lighting of the Application Site and Temporary Construction Area would cause a large change to the night time views for the low sensitivity visual receptors on the road. This would result in a moderate adverse effect.
Viewpoint 5: A30 Overbridge, 900 m East of the Application Site

4.187 Visual receptors travelling over the A30 on the local road would have the majority of views of the temporary construction works screened from view by the mature vegetation on the intervening land to the west. The elevated construction works on the Application Site may be partially visible for a short duration for transient receptors travelling west but would not be noticeable. The mature trees around Lower Southwood Farm would prevent views of the ground and low level construction works. The temporary construction phase of the proposed development would cause a negligible change to views for the transient receptors in vehicles on the local road. This would result in a negligible adverse effect upon the low sensitivity receptors.

4.188 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the low sensitivity visual receptors on the road. This would result in a negligible adverse effect.

Viewpoint 6: Marwood Lane, 440 m South of the Application Site

4.189 The temporary construction phase of the proposed development would be partially visible for visual receptors at Marwood Lane. The ground level activities on the Application Site would be screened from view by the vegetation and landform of the intervening ground. More elevated construction works would be partially visible in the oblique views north for the transient visual receptors passing along the road. Although the roadside vegetation along the elevated carriageway of the A30 limits some views to the north, some of the construction works would be visible but not noticeable. The temporary construction phase of the proposed development would cause a small change to views along Marwood Lane. This would result in a negligible adverse effect upon the low sensitivity visual receptors with transient views.

4.190 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views where car lights on the A30 are visible for the low sensitivity visual receptors on the road. This would result in a negligible adverse effect.

Viewpoint 7: Long Lane at South-Eastern Corner of the Application Site

4.191 Visual receptors travelling along this section of Long Lane would have clear views of the temporary construction activities on the Application Site. The construction works would be seen in close range views as visual receptors pass the Application Site and although the hedgerow field boundary that lines the road would limit some views of construction, the scale of construction would be clearly visible. The context of the view for receptors passing the Application Site would be altered by the construction activities being visible at such close range. The temporary construction phase of the proposed development would cause a large change to views for visual receptors in this location. This would result in a moderate adverse effect upon the low sensitivity visual receptors.

4.192 Night time security lighting of the Application Site and Temporary Construction Area would cause a large change to the night time views for the low sensitivity visual receptors on the road. This would result in a moderate adverse effect.
Viewpoint 8: Long Lane at South-Western Corner of the Application Site

4.193 Similarly to the south-eastern corner of the Application Site, the temporary construction activities would be visible in close range views for visual receptors travelling along this section of the road. The context of the view for receptors passing the Application Site would be altered by the construction activities being visible at such close range. The temporary construction phase of the proposed development would cause a large change to views for visual receptors in this location. This would result in a moderate adverse effect upon the low sensitivity visual receptors.

4.194 Night time security lighting of the Application Site and Temporary Construction Area would cause a large change to the night time views for the low sensitivity visual receptors on the road. This would result in a moderate adverse effect.

Viewpoint 9: Antiques Complex off Long Lane, 190 m West of the Application Site

4.195 The temporary construction phase of the proposed development would be entirely screened from view for visual receptors in the westerly units of the Antiques Complex. However, those visual receptors at units on the eastern side of the Antiques Complex would have some close range views of the temporary construction phase of the proposed development both to the north and east. The ground level and more elevated construction activities would be visible at close range for the duration of the construction phase. The construction works would be seen in the view that currently comprises farmland. The modification of rural views during the temporary construction phase of the proposed development would cause a large change to views for visual receptors within the commercial units of the Antiques Complex. This would cause a moderate adverse effect upon the low sensitivity receptors.

4.196 Night time security lighting of the Application Site and Temporary Construction Area would cause a negligible change to the night time views for the low sensitivity visual receptors. This would result in a negligible adverse effect.

Viewpoint 10: Business Park at Exeter International Airport, 750 m West of the Application Site

4.197 Activities on the Application Site during the temporary construction phase of the proposed development to the east would be mainly screened from view from the eastern edge of the Business Park and Hotel. However, the more elevated construction activities would be seen above the existing development and vegetation at the Antiques Complex. Where visible, the construction activities would be seen against the skyline above the woodland at Rockbeare Manor Estate that forms the backdrop to the view. The temporary construction phase of the proposed development would cause a medium change to views. This would result in a minor adverse effect upon the low sensitivity receptors at Exeter International Airport Business Park.

4.198 Night time security lighting of the Application Site and Temporary Construction Area would cause a medium change to the night time views for the low sensitivity visual receptors. This would result in a minor adverse effect.

Viewpoint 11: A30 Overbridge on the B3184, 1 km South-West of the Application Site

4.199 The temporary construction phase of the proposed development would be seen within the context of the existing development of the Business Park in the foreground and the Antiques...
Complex to the north-east. Visual receptors passing along the B3184 would have some fleeting views of the more elevated construction operations on the Application Site as they pass along the bridge that allows glimpsed views to the north-east. The ground level operations would be screened from view by the intervening development and vegetation. The temporary construction phase of the proposed development would cause a small change to the glimpsed views. This would result in a negligible adverse effect upon the low sensitivity receptors.

4.200 Night time security lighting of the Application Site and Temporary Construction Area would cause a small change to the night time views for the low sensitivity visual receptors on the road. This would result in a negligible adverse effect.

Assessment of Landscape and Visual Effects during Operation

4.201 This assessment has been conducted based upon a Year 0 scenario of the proposed development. Any effects identified are anticipated to lessen over time as mitigation planting matures to facilitate the development's incorporation into the landscape.

Landscape Effects

4.202 Both development options occupy the same operational area and so there would be no variance in landscape effects between the two options. As such, the landscape effects identified below apply to both development options.

National Character Area Profile

4.203 The permanent operational phase of the proposed development would add an additional industrial scale development to an area of the Devon Redlands NCA that is already heavily influenced by industrial development and significant communication corridors as well as the large landscape influence of Exeter International Airport. The proposed development would not be out of character with the existing levels of industrial and large scale development in this part of the large Character Area.

4.204 Existing levels of disturbance in the landscape such as Exeter International Airport, business parks and the numerous large communications corridors extend the sense of development east from Exeter and provide a context for industrial scale development. The proposed development would not be large scale enough to materially affect the character of the large NCA and would not compromise the characteristic hilly landscape, steep sided river valleys, large woodlands, cliffs or ridgelines of the Devon Redlands. The proposed development would not alter the distinctive vernacular of red sandstone buildings or landscape setting of the Haldon Ridge that are key characteristics of the NCA.

4.205 The proposed development would cause a small change to the character of the National Character Area 148: Devon Redlands. This would result in a minor adverse effect upon the medium sensitivity NCA.

Devon’s Landscape Character Assessment

4.206 The permanent operational phase of the proposed development would increase the level of industrial development within Landscape Character Type 3E: Lowland Plains, within the Clyst
Lowland Farmlands Character Area. The existing level of industrial scale development within the Character Type sets a context for this kind of development with the transport corridors, Exeter International Airport and Business Park exhibiting an existing level of disturbance in this part of the Lowland Plains.

4.207 The proposed development would not compromise the characteristic elements of the Character Type such as Orchards, Historic Parkland, pattern of villages along watercourses or the cob and thatch vernacular. The HVDC would exist within an area of the Character Type that is heavily influenced by the existing disturbance caused by Exeter International Airport, industrial development and transport corridors and would cause a small change to the Lowland Plains. This would result in a minor adverse effect upon the medium sensitivity Character Type.

Local Landscape

4.208 The proposed development would increase the amount of industrial scale development in the local area and would modify the Application Site from farmland to industrial. The large buildings and industrial elements would be uncharacteristic of the Application Site, but not the local area where recent development at the Business Park to the west and some of the storage units at the Antiques Complex mean that the industrial scale of the proposed development would not be out of place in the local area.

4.209 Cut and fill to create a flat base for the proposed development would leave embankments in the north of the Application Site that would be elevated above the adjacent fields and cuttings in the south of the Application Site where the proposed development would be lower than the ground level of adjacent land. The majority of boundary features would remain in place around the Application Site although a small amount of hedgerow would be removed. The mature hedgerow trees would remain unaffected by the proposed development but the existing vegetation would be enhanced by mitigation planting on the Application Site.

4.210 The proposed development would cause a large change to the character of the Application Site and Local Landscape. This would result in a major adverse effect due to the medium sensitivity to change that Application Site and surrounding area exhibit.

Designated Landscapes

4.211 The permanent operational phase of the proposed development would not cause any direct changes to the character of Rockbeare Manor Grade II Registered Park and Garden. The proposed development would be separated from the main area of the parkland by the landscape buffer that the plantation woodland on the western edge provides as well as the farmland on the intervening land.

4.212 The proposed development would give rise to some perceived landscape changes but would not directly affect the character of the designated landscape. This would cause a negligible change to the character of the high sensitivity designated landscape and would result in a minor adverse effect upon Rockbeare Manor.
Visual Effects

4.213 The visual effects for the two illustrative layout options in Figure 2.3 (Option 1) and Figure 2.4 (Option 2) are considered for each of the likely visual receptors identified during the baseline assessment.

Residential Properties

Antiques Complex

4.214 Option 1 - The visual receptors at the residential properties within the Antiques Complex would have the majority of the proposed development screened from view by the existing vegetation and development to the east. Some of the most elevated parts of the proposed development may appear as visible above the existing vegetation and development to the east of the properties. The permanent operational phase of the proposed development may be partially visible in some filtered views through the hedgerow vegetation. The proposed development would cause a small change to views the large building is visible due to the high level of screening by the existing vegetation and development on intervening land. This would result in a moderate adverse effect upon the high sensitivity receptors.

4.215 Option 2 - The visual receptors at the residential properties within the Antiques Complex would have the majority of the proposed development screened from view by the existing vegetation and development to the east. Some of the most elevated parts of the proposed development may appear as visible above the existing vegetation and development to the east of the properties. The permanent operational phase of the proposed development may be partially visible in some filtered views through the hedgerow vegetation. The proposed development would cause a small change to views where the buildings and external elements are visible due to the high level of screening by the existing vegetation and development on intervening land. This would result in a moderate adverse effect upon the high sensitivity receptors.

Higher Southwood Farm

4.216 Option 1 - The majority of the proposed development on the Application Site would not be visible for visual receptors within the residential property at Higher Southwood Farm. The foreground screening of views out by the farm buildings adjacent to the residential property means that visibility of the large building that forms part of the proposed development would be limited. Views to the north would remain the main focus of visual receptors within the residential property and its curtilage. The proposed development would cause a negligible change to views for visual receptors at Higher Southwood Farm. This would result in a minor adverse effect upon the high sensitivity receptors.

4.217 Option 2 - The majority of the proposed development on the Application Site would not be visible for visual receptors within the residential property at Higher Southwood Farm. The foreground screening of views out by the farm buildings adjacent to the residential property means that visibility of the large building and external elements that form the proposed development would be limited. Views to the north would remain the main focus of visual receptors within the residential property and its curtilage. The proposed development would cause a negligible
change to views for visual receptors at Higher Southwood Farm. This would result in a minor adverse effect upon the high sensitivity receptors.

Lower Southwood Farm

4.218 Option 1 - The proposed development would be partially visible in views for visual receptors at the residential property of Lower Southwood Farm. The main focus of views would remain into the gardens to the south. Where the large building of the proposed development is visible, it would be seen amongst the existing development at the Antiques Complex and Business Park beyond and the mature hedgerow trees on the intervening land. The proposed development would cause a small change to views from a side window of the residential property and would not alter the focus of views from the property. This would result in a moderate adverse effect upon the high sensitivity receptors within the property.

Lower Southwood Farm

4.219 Option 2 - The proposed development would be partially visible in views for visual receptors at the residential property of Lower Southwood Farm. The main focus of views would remain into the gardens to the south. Where the large buildings and external elements of the proposed development are visible, they would be seen amongst the existing development at the Antiques Complex and Business Park beyond and the mature hedgerow trees on the intervening land. The proposed development would cause a small change to views from a side window of the residential property and would not alter the focus of views from the property. This would result in a moderate adverse effect upon the high sensitivity receptors within the property.

Woodhouse Farm

4.220 Option 1 - The large buildings of the proposed development would be seen in oblique views for visual receptors within the residential property and curtilage at Woodhouse Farm. The development would occupy a small part of the overall view from the property where views west over the airport runway and surrounding fields would remain the focus of vistas. The large scale development at the Business Park of Exeter International Airport provides a context for industrial scale development in the rural views. The large buildings of the proposed development would be seen against a backdrop of mature vegetation and would not change the context of views. The proposed development would cause a small change to views that would result in a moderate adverse effect upon the high sensitivity receptors at Woodhouse Farm.

Similarly, the permanent operational phase of the proposed development would cause a small change to views from the three residential properties on Silver Lane to the south of Woodhouse Farm. This would result in a moderate adverse effect upon the high sensitivity receptors in these properties.

4.222 Option 2 - The large buildings and external elements of the proposed development would be seen in oblique views for visual receptors within the residential property and curtilage at Woodhouse Farm. The development would occupy a small part of the overall view from the property where views west over the airport runway and surrounding fields would remain the focus of vistas. The large scale development at the Business Park of Exeter International Airport provides a context for industrial scale development in the rural views. The large buildings of the proposed development would be seen against a backdrop of mature vegetation and would not
change the context of views. The proposed development would cause a small change to views that would result in a moderate adverse effect upon the high sensitivity receptors at Woodhouse Farm.

4.223 Similarly, the permanent operational phase of the proposed development would cause a small change to views from the three residential properties on Silver Lane to the south of Woodhouse Farm. This would result in a moderate adverse effect upon the high sensitivity receptors in these properties.

*Rockbeare Manor*

4.224 Option 1 - Visual receptors at Rockbeare Manor would have limited visibility of the large building on the east of the proposed development although the taller parts may be visible from the very upper parts of the residential property. Where visible, the large building of the proposed development would be seen within the context of views towards Exeter International Airport and the Business Park adjacent to it. Where the proposed development is visible from Rockbeare Manor, it would cause a negligible change to views that would be focused on the Parkland. This would result in a minor adverse effect upon the high sensitivity receptors.

4.225 Option 2 - Visual receptors at Rockbeare Manor would have limited visibility of the large buildings and external elements on the east of the proposed development. The taller parts may be visible from the very upper parts of the residential property. Where visible, the top of the large building and external elements of the proposed development would be seen within the context of views towards Exeter International Airport and the Business Park adjacent to it. Where the proposed development is visible from Rockbeare Manor, it would cause a negligible change to views that would be focused on the Parkland. This would result in a minor adverse effect upon the high sensitivity receptors.

*Shutebridge Farm and Beautiport Farm*

4.226 Option 1 - Visual receptors at these residential properties would have some views of the large buildings and external elements of the proposed development screened by the vegetation in the fore and middle ground. Some partial views of the tops of the buildings and external elements may be available over the vegetation that occupies the intervening land. Where the proposed development is visible from the vicinity of Shutebridge Farm and Beautiport Farm, it would be a minor component of the rural views and would be easily missed amongst the high level of vegetation around the fields where views extend east over the airport runway. The proposed development would cause a negligible change to views that the high sensitivity receptors witness. This would result in a minor adverse effect.

4.227 Option 2 - Visual receptors at these residential properties would have some views of the large buildings of the proposed development screened by the vegetation in the fore and middle ground. Some partial views of the tops of the buildings may be available over the vegetation that occupies the intervening land. Where the proposed development is visible from the vicinity of Shutebridge Farm and Beautiport Farm, it would be a minor component of the rural views and would be easily missed amongst the high level of vegetation around the fields where views extend east over the.
airport runway. The proposed development would cause a negligible change to views that the high sensitivity receptors witness. This would result in a minor adverse effect.

**Farringdon House**

4.228 Option 1 - The existing levels of visual screening provided by vegetation on the land between the residential properties around Farringdon House and the Application Site would screen the majority of buildings and external elements of the proposed development from view for the various visual receptors. The highest parts of the buildings and external elements may be partially visible above the vegetation in views to the north but would not form a noticeable part of the view. The proposed development would cause a negligible change to views for visual receptors in the residential properties of Farringdon House, The Lodge, Meadow Lodge and properties along The Drive. This would result in a minor adverse effect upon the high sensitivity receptors.

4.229 Option 2 - The existing levels of visual screening provided by vegetation on the land between the residential properties around Farringdon House and the Application Site would screen the majority of the large buildings of the proposed development from view for the various visual receptors. The tops of the buildings may be partially visible above the vegetation in views to the north but would not form a noticeable part of the view. The proposed development would cause a negligible change to views for visual receptors in the residential properties of Farringdon House, The Lodge, Meadow Lodge and properties along The Drive. This would result in a minor adverse effect upon the high sensitivity receptors.

**Marwood Cross**

4.230 Option 1 - The large buildings and external elements of the proposed development would be mainly screened from view for visual receptors at Marwood Cross by the vegetation to the north and elevated section of A30 carriageway. The highest parts of the proposed development would be seen above the vegetation and landform to the north. The tops of the buildings and external elements would be seen in the context of the moving traffic on the elevated A30 between the residential properties and the Application Site and would cause a small change to views north. This would result in a moderate adverse effect upon the high sensitivity visual receptors.

4.231 Option 2 - The large buildings of the proposed development would be mainly screened from view for visual receptors at Marwood Cross by the vegetation to the north and elevated section of A30 carriageway. The tops of the buildings would be seen above the vegetation and landform to the north. The tops of the buildings and external elements would be seen in the context of the moving traffic on the elevated A30 between the residential properties and the Application Site and would cause a small change to views north. This would result in a moderate adverse effect upon the high sensitivity visual receptors.

**Wares Farm**

4.232 Option 1 - Visual receptors within the residential property and curtilage at Wares Farm would have some partial views of the large buildings and external elements. The majority of the development would be screened from view by the intervening vegetation and development but some of the highest parts may be visible in views to the north-east for visual receptors at the
property. Views over the elevated section of the A30 and vegetation that lines it would include partial elements of the proposed development but would not change the character of views from the residential property. The proposed development would cause a negligible change to views from Wares Farm due to the intervening elements. This would result in a minor adverse effect upon the high sensitivity visual receptors.

4.233 Option 2 - Visual receptors within the residential property and curtilage at Wares Farm would have some partial views of the large buildings. The majority of the development would be screened from view by the intervening vegetation and development but the tops of the buildings may be visible in views to the north-east for visual receptors at the property. Views over the elevated section of the A30 and vegetation that lines it would include partial elements of the proposed development but would not change the character of views from the residential property. The proposed development would cause a negligible change to views from Wares Farm due to the intervening elements. This would result in a minor adverse effect upon the high sensitivity visual receptors.

Clystlands

4.234 Option 1 - The proposed development would be mainly screened from view for visual receptors within residential properties and their curtilages off Station Road. Where receptors have longer views from the upper floor windows, the tops of the large buildings may be visible in oblique views to the south-east. The proposed development would not form a noticeable part of views for visual receptors in these properties and would be mainly screened by intervening elements. Where elements of the development can be seen from these properties, they would cause a negligible change to views. This would result in a minor adverse effect upon the high sensitivity receptors.

Cranbrook

4.235 Option 2 - The proposed development would be mainly screened from view for visual receptors within residential properties and their curtilages off Station Road. Where receptors have longer views from the upper floor windows, the tops of the large buildings and external elements may be visible in oblique views to the south-east. The proposed development would not form a noticeable part of views for visual receptors in these properties and would be mainly screened by intervening elements. Where elements of the development can be seen from these properties, they would cause a negligible change to views. This would result in a minor adverse effect upon the high sensitivity receptors.

4.236 Option 1 - The majority of the proposed development would be screened from view for the visual receptors on the southern edge of the recent development at Cranbrook as well as the more established properties of South Whimple and Treasbeare Cottages. The ground level and lower parts of the proposed development would be screened from view by the intervening topography but where views of the tops of buildings and external elements are available, they would be seen within the context of Exeter International Airport and associated development. The proposed development would cause a negligible change to views for the high sensitivity receptors. This would result in a minor adverse effect.
4.237 Option 2 - The majority of the proposed development would be screened from view for the visual receptors on the southern edge of the recent development at Cranbrook as well as the more established properties of South Whimple and Treasbeare Cottages. The ground level and lower parts of the proposed development would be screened from view by the intervening topography but where views of the tops of buildings and external elements are available, they would be seen within the context of Exeter International Airport and associated development. The proposed development would cause a negligible change to views for the high sensitivity receptors. This would result in a minor adverse effect.

Treasbeare Farm

4.238 Option 1 - Some partial views of the proposed development adjacent to the existing antiques complex would be available for visual receptors looking south-east from Treasbeare Farm. The banked earth to raise the ground levels means that the embankments would also be partially visible with the large buildings on top of them at either edge of the Application Site and the external elements in-between. The proposed development would not extend the existing disturbance in the view as the airport runway extends east beyond the Application Site. Where it is visible in views to the south-east from the property and curtilage of Treasbeare Farm, the proposed development would not appear above the skyline and would not alter the character of the views. The proposed development would introduce an added element of disturbance to the views that visual receptors in the residential property and curtilage have to the south-west and would cause a small change to the already disturbed view from Treasbeare Farm. This would result in a moderate adverse effect upon the high sensitivity receptors.

4.239 Option 2 - Some partial views of the proposed development adjacent to the existing antiques complex would be available for visual receptors looking south-east from Treasbeare Farm. The banked earth to raise the ground levels means that the embankments would also be partially visible with the external elements on top of them partially screening the large buildings beyond. The proposed development would not extend the existing disturbance in the view as the airport runway extends east beyond the Application Site. Where it is visible in views to the south-east from the property and curtilage of Treasbeare Farm, the proposed development would not appear above the skyline and would not alter the character of the views. The proposed development would introduce an added element of disturbance to the views that visual receptors in the residential property and curtilage have to the south-west and would cause a small change to the already disturbed view from Treasbeare Farm. This would result in a moderate adverse effect upon the high sensitivity receptors.

Rockbeare

4.240 Option 1 - Vegetation on the intervening land between the proposed development and the residential properties that make up the settlement of Rockbeare would screen the majority of the proposed development from view for visual receptors. The top of the large buildings and external elements would be visible from the settlement of Rockbeare over the relatively low lying intervening land that allows short and wide vistas. The proposed development would cause a negligible change to views for visual receptors within the residential properties as they would not
alter the character of views to the south. This would result in a minor adverse effect upon the high sensitivity receptors.

4.241 Option 2 - Vegetation on the intervening land between the proposed development and the residential properties that make up the settlement of Rockbeare would screen the majority of the proposed development from view for visual receptors. The top of the large buildings and external elements would be visible from the settlement of Rockbeare over the relatively low lying intervening land that allows short and wide vistas. The proposed development would cause a negligible change to views for visual receptors within the residential properties as they would not alter the character of views to the south. This would result in a minor adverse effect upon the high sensitivity receptors.

Roads

Long Lane

4.242 Option 1 - Visual receptors travelling along Long Lane would have some close range views of the proposed development that would form a large element in views for visual receptors as they pass the Application Site. Although the proposed development would not interrupt any key views, it would extend the industrial elements of the view and occupy large areas of the oblique views north as vehicles pass the Application Site with the external elements visible as they pass the large buildings. Due to the close range views that transient receptors would receive as they pass along Long Lane, the industrial scale proposed development would cause a large change to views that already include large industrial buildings at the Business Park around Exeter International Airport. This would result in a moderate adverse effect upon the low sensitivity receptors.

4.243 Option 2 - Visual receptors travelling along Long Lane would have some close range views of the proposed development that would form a large element in views for visual receptors as they pass the Application Site. Although the proposed development would not interrupt any key views, it would occupy large areas of the oblique views north as vehicles pass the Application Site. Due to the close range views that transient receptors would receive as they pass along Long Lane, the industrial scale proposed development would cause a large change to views that already include large industrial buildings at the Business Park around Exeter International Airport. This would result in a moderate adverse effect upon the low sensitivity receptors.

A30

4.244 Option 1 - The proposed development would be partially visible in oblique views as visual receptors travel along the elevated section of the A30. Views to the north through gaps in the roadside vegetation would feature the large buildings and external elements of the development but would only be visible for a very short section of the route where existing industrial scale development is already visible such as that at Exeter International Airport Business Park. The proposed development would cause a small change to views from the A30 carriageway where existing development around the airport and runway provide a context for industrial scale development in oblique views north. This would result in a negligible adverse effect upon the low sensitivity visual receptors travelling on the elevated section of road.
4.245 Option 2 - The proposed development would be partially visible in oblique views as visual receptors travel along the elevated section of the A30. Views to the north through gaps in the roadside vegetation would feature the large buildings of the development but would only be visible for a very short section of the route where existing industrial scale development is already visible such as that at Exeter International Airport Business Park. The proposed development would cause a small change to views from the A30 carriageway where existing development around the airport and runway provide a context for industrial scale development in oblique views north. This would result in a negligible adverse effect upon the low sensitivity visual receptors travelling on the elevated section of road.

Silver Lane

4.246 Option 1 - The proposed development would be screened from view along much of Silver Lane for visual receptors by the roadside vegetation and hedgebanks. However, a small number of locations allow views over the wider landscape such as gateways and locations where the land undulates and the proposed development would be visible. The proposed development would cause a large change to the closest views where transient receptors would have visibility of the broad side of a large building straight on. This would result in a moderate adverse effect upon the low sensitivity receptors using Silver Lane.

4.247 Option 2 - The proposed development would be screened from view along much of Silver Lane for visual receptors by the roadside vegetation and hedgebanks. However, a small number of locations allow views over the wider landscape such as gateways and locations where the land undulates and the proposed development would be visible. The proposed development would cause a large change to the closest views where transient receptors would have visibility of the large buildings and external elements. This would result in a moderate adverse effect upon the low sensitivity receptors using Silver Lane.

B3174 – London Road

4.248 Option 1 - The proposed development area would not be visible for visual receptors travelling along the B3174. Vegetation, existing development and landform of the immediate foreground and intervening land would provide sufficient visual screening to prevent the proposed development from being visible in oblique views. The proposed development would not cause any changes to views and would not result in any effects upon the low sensitivity visual receptors.

4.249 Option 2 - The proposed development area would not be visible for visual receptors travelling along the B3174. Vegetation, existing development and landform of the immediate foreground and intervening land would provide sufficient visual screening to prevent the proposed development from being visible in oblique views. The proposed development would not cause any changes to views and would not result in any effects upon the low sensitivity visual receptors.

Parsons Lane

4.250 Option 1 - Visual receptors travelling along the local road of Parsons Lane would have some glimpsed oblique views of the tops of the buildings and external elements while the lower parts would be screened from view by the intervening landform and vegetation. The roadside hedgerows would prevent views of the development for much of the route and channel views
along the route of the road. Where the development is visible for receptors, it would not form a noticeable element in views and would not alter the context of views for receptors using the road. The proposed development would cause a negligible change to views along Parsons Lane. This would result in a negligible adverse effect upon the low sensitivity receptors.

4.251 Option 2 - Visual receptors travelling along the local road of Parsons Lane would have some glimpsed oblique views of the tops of the buildings behind the external elements while the lower parts would be screened from view by the intervening landform and vegetation. The roadside hedgerows would prevent views of the development for much of the route and channel views along the route of the road. Where the development is visible for receptors, it would not form a noticeable element in views and would not alter the context of views for receptors using the road. The proposed development would cause a negligible change to views along Parsons Lane. This would result in a negligible adverse effect upon the low sensitivity receptors.

B3184

4.252 Option 1 - The proposed development would be screened from view for much of the route of the B4184 by foreground development, vegetation and landform. The proposed development would be partially visible in a small number of glimpsed oblique views as the transient receptors pass along the route where parts of the industrial scale development would be seen. The proposed development would cause a medium change to views for visual receptors travelling along the B3184 and would not form a prominent element in the oblique views. This would result in a minor adverse effect upon the low sensitivity receptors.

4.253 Option 2 - The proposed development would be screened from view for much of the route of the B4184 by foreground development, vegetation and landform. The proposed development would be partially visible in a small number of glimpsed oblique views as the transient receptors pass along the route where parts of the industrial scale development would be seen. The proposed development would cause a medium change to views for visual receptors travelling along the B3184 and would not form a prominent element in the oblique views. This would result in a minor adverse effect upon the low sensitivity receptors.

Public Rights of Way

Rockbeare Bridleway 8

4.254 Option 1 - The proposed development would be screened from view for visual receptors on the majority of the footpath route by foreground vegetation, with the exception of the very western section. Much of the proposed development would be screened from view for visual receptors on the Bridleway by the intervening vegetation but the tops of the large buildings may be visible above the trees to the west. Where the development is visible above the vegetation on intervening land, it would not be an obvious element in the view and would only have the potential to be seen for a short duration by the transient receptors. The proposed development would cause a negligible change to views for the high sensitivity receptors. This would result in a minor adverse effect.

4.255 Option 2 - The proposed development would be screened from view for visual receptors on the majority of the footpath route by foreground vegetation, with the exception of the very western section. Much of the proposed development would be screened from view for visual receptors on the Bridleway by the intervening vegetation but the tops of the large buildings may be visible above the trees to the west. Where the development is visible above the vegetation on intervening land, it would not be an obvious element in the view and would only have the potential to be seen for a short duration by the transient receptors. The proposed development would cause a negligible change to views for the high sensitivity receptors. This would result in a minor adverse effect.
section. Much of the proposed development would be screened from view for visual receptors on
the Bridleway by the intervening vegetation but the tops of the large buildings and external
elements may be visible above the trees to the west. Where the development is visible above
the vegetation on intervening land, it would not be an obvious element in the view and would only
have the potential to be seen for a short duration by the transient receptors. The proposed
development would cause a negligible change to views for the high sensitivity receptors. This
would result in a minor adverse effect.

**Aylesbeare Footpath 4 and Rockbeare Footpath 7**

4.256 Option 1 - Some parts of the proposed development would be visible above the existing
vegetation on the intervening land for visual receptors using the local footpaths of Aylesbeare
Footpath 4 and Rockbeare Footpath 7. Many views of the proposed development from the paths
would be screened by foreground vegetation but where longer views over the open fields are
available, the tops of the buildings and external elements may form part of the vistas. Where the
proposed development is visible, it would form a very minor component in the view and would not
affect the rural character of the local footpaths. The proposed development would cause a
negligible change to views to the north. This would result in a minor adverse effect upon the high
sensitivity receptors using the short distance paths.

4.257 Option 1 - Some parts of the proposed development would be visible above the existing
vegetation on the intervening land for visual receptors using the local footpaths of Aylesbeare
Footpath 4 and Rockbeare Footpath 7. Many views of the proposed development from the paths
would be screened by foreground vegetation but where longer views over the open fields are
available, the tops of the buildings may form part of the vistas. Where the proposed development
is visible, it would form a very minor component in the view and would not affect the rural
character of the local footpaths. The proposed development would cause a negligible change to
views to the north. This would result in a minor adverse effect upon the high sensitivity
receptors using the short distance paths.

**Aylesbeare Footpath 7**

4.258 Option 1 - visual receptors travelling along the local route of Aylesbeare Footpath 7 would have
views of the majority of the proposed development screened by foreground vegetation. Where
longer views to the north are available and not prevented by foreground vegetation, the tops of
buildings and external elements may be visible when searched for by the receptors. The
proposed development would cause a negligible change to views to the north from the local
footpath as the construction works would not be noticeable. This would result in a minor adverse
effect upon the high sensitivity receptors using the short distance route.

4.259 Option 1 - visual receptors travelling along the local route of Aylesbeare Footpath 7 would have
views of the majority of the proposed development screened by foreground vegetation. Where
longer views to the north are available and not prevented by foreground vegetation, the tops of
buildings may be visible when searched for by the receptors. The proposed development would
cause a negligible change to views to the north from the local footpath as the construction works
would not be noticeable. This would result in a minor adverse effect upon the high sensitivity
receptors using the short distance route.
Rockbeare Footpath 1

4.260 The effects of the proposed development upon visual receptors using Rockbeare Footpath 1 are considered at Viewpoint 1.

Commercial Premises

Antiques Complex

4.261 Option 1 - The broad side of the large building would be seen in views from the eastern units at the Antiques Complex by visual receptors. Views for receptors in the eastern units would include close range visibility of the proposed development. However, there would be no change to visual amenity for visual receptors in many of the commercial units at the Antiques Complex due to the screening provided by other buildings immediately adjacent to them. Where close range views of the proposed development are available, they would cause a large change to views at the commercial premises. This would result in a moderate adverse effect upon the low sensitivity receptors.

4.262 Option 2 - The large buildings and external elements would be seen in views from the eastern units at the Antiques Complex by visual receptors. Views for receptors in the eastern units would include close range visibility of the proposed development. However, there would be no change to visual amenity for visual receptors in many of the commercial units at the Antiques Complex due to the screening provided by other buildings immediately adjacent to them. Where close range views of the proposed development are available, they would cause a large change to views at the commercial premises. This would result in a moderate adverse effect upon the low sensitivity receptors.

4.263 The effects upon views from publicly accessible parts of the Antiques Complex are discussed at Viewpoint 9.

Exeter International Airport Business Park

4.264 Option 1 - The broad side of the large building would only be partially visible from a small section of the Business Park on the eastern edge due to the majority of views being contained by adjacent units. Where views to the east are available for visual receptors at the Business Park, the ground works and lower parts of the development would be screened from view by the existing vegetation, development and local topography. However, the higher parts of the development would be partially visible above the existing development at the Antiques Complex in views to the east. The proposed development would cause a medium change to the views east available from the eastern edge of the Business Park. This would result in a minor adverse effect upon the low sensitivity receptors within the commercial buildings.

4.265 Option 2 - The large buildings and external elements would only be partially visible from a small section of the Business Park on the eastern edge due to the majority of views being contained by adjacent units. Where views to the east are available for visual receptors at the Business Park, the ground works and lower parts of the development would be screened from view by the existing vegetation, development and local topography. However, the higher parts of the development would be partially visible above the existing development at the Antiques Complex in views to the east. The proposed development would cause a medium change to the views
east available from the eastern edge of the Business Park. This would result in a minor adverse effect upon the low sensitivity receptors within the commercial buildings.

**Representative Viewpoints**

4.266 Photomontages have been prepared for a number of the representative viewpoints and show the proposed development on the Application Site on a Year 0 status and prior to completion of any embankments and mitigation planting. The buildings are represented as a standard grey colour in the photomontages. The photomontages can be found at Figure 4.7.

*Viewpoint 1: Rockbeare Footpath 1, 1.8 km North of the Application Site*

4.267 Option 1 - The majority of the proposed development would be screened from view for visual receptors on the short distance footpath by vegetation on the intervening land. The relatively low lying farmland to the south of the footpath allows for some wide but short distance vistas that mean only the tops of the buildings and external elements may appear in the some views to the south above the vegetation and gently undulating topography. The proposed development would cause a negligible change to views for visual receptors within the residential properties as they would not alter the character of views to the south. This would result in a minor adverse effect upon the high sensitivity receptors.

4.268 Option 2 - The majority of the proposed development would be screened from view for visual receptors on the short distance footpath by vegetation on the intervening land. The relatively low lying farmland to the south of the footpath allows for some wide but short distance vistas that mean only the tops of the buildings with external elements in front may appear in the some views to the south above the vegetation and gently undulating topography. The proposed development would cause a negligible change to views for visual receptors within the residential properties as they would not alter the character of views to the south. This would result in a minor adverse effect upon the high sensitivity receptors.

*Viewpoint 2: Rockbeare Recreation Ground, 1.3km North-West of the Application Site*

4.269 Option 1 - The proposed development would be mainly screened from view for visual receptors at the Rockbeare Recreation Ground due to the vegetation and gently undulating topography that limit views to the south. The tops of the buildings and external elements of the proposed development may appear in views south above the vegetation that forms the current extent of views but would not be an obvious component of the vista. The proposed development would cause a negligible change to views that receptors’ witness from the Rockbeare Recreation Ground. This would result in a negligible adverse effect upon the low sensitivity receptors using the recreational facilities and a minor adverse effect on any visual receptors within the residential properties along the northern edge.

4.270 Option 2 - The proposed development would be mainly screened from view for visual receptors at the Rockbeare Recreation Ground due to the vegetation and gently undulating topography that limit views to the south. The tops of the buildings with external elements in front may appear in views south above the vegetation that forms the current extent of views but would not be an obvious component of the vista. The proposed development would cause a negligible change to views that receptors’ witness from the Rockbeare Recreation Ground. This would result in a
negligible adverse effect upon the low sensitivity receptors using the recreational facilities and a minor adverse effect on any visual receptors within the residential properties along the northern edge.

Viewpoint 3: Silver Lane at Higher Southwood Farm, 180 m East of the Application Site

4.271 Option 1- Visual receptors passing along this section of Silver Lane would have some clear views of the large building and external elements over the agricultural field to the south-west. The development would be visible above the hedgerow that forms the eastern boundary of the Application Site and would be noticeable as the receptors pass along the local road of Silver Lane. The embankment on the eastern edge of the Application Site would partially screen the boundary fence in some places and would raise the height of the planting to aid mitigation planting as it matures. The proposed development would cause a large change to views from this section of the road and would result in a moderate adverse effect upon the low sensitivity visual receptors on it.

4.272 Option 2- Visual receptors passing along this section of Silver Lane would have some clear views of the broad side of the large building over the agricultural field to the south-west. The development would be visible above the hedgerow that forms the eastern boundary of the Application Site and would be noticeable as the receptors pass along the local road of Silver Lane. The embankment on the eastern edge of the Application Site would partially screen the boundary fence in some places and would raise the height of the planting to aid mitigation planting as it matures. The proposed development would cause a large change to views from this section of the road and would result in a moderate adverse effect upon the low sensitivity visual receptors on it.

Viewpoint 4: Long Lane West of Junction with Silver Lane, 170 m East of the Application Site

4.273 Option 1 - The proposed development would be partially visible to visual receptors on this section of Long Lane due to the close proximity of the proposed development to the road. Views along the length of the road would include the broad side of the large buildings to the north-west. The large buildings would draw views away from the mature trees that line the road and would be noticeable for visual receptors. The proposed development would add clutter and industrial scale development to this section of the route and would cause a large change to views for the low sensitivity visual receptors. This would result in a moderate adverse effect.

4.274 Option 2 - The proposed development would be partially visible to visual receptors on this section of Long Lane due to the close proximity of the proposed development to the road. Views along the length of the road would include the large buildings and external elements to the north-west. The large buildings would draw views away from the mature trees that line the road and would be noticeable for visual receptors. The proposed development would add clutter and industrial scale development to this section of the route and would cause a large change to views for the low sensitivity visual receptors. This would result in a moderate adverse effect.

Viewpoint 5: A30 Overbridge, 900 m East of the Application Site

4.275 Option 1 - Visual receptors travelling over the A30 on the local road would have the majority of views of the proposed development screened from view by the mature vegetation on the
intervening land to the west. The tops of the large buildings and external elements may be partially visible for a short duration for transient receptors travelling west but would not be noticeable. The mature trees around Lower Southwood Farm would prevent views of most of the development, but where views do include it, the proposed development would cause a negligible change to views for the transient receptors in vehicles on the local road. This would result in a minor adverse effect upon the low sensitivity receptors.

4.276 Option 2 - Visual receptors travelling over the A30 on the local road would have the majority of views of the proposed development screened from view by the mature vegetation on the intervening land to the west. The tops of the large buildings may be partially visible for a short duration for transient receptors travelling west but would not be noticeable. The mature trees around Lower Southwood Farm would prevent views of most of the development, but where views do include it, the proposed development would cause a negligible change to views for the transient receptors in vehicles on the local road. This would result in a minor adverse effect upon the low sensitivity receptors.

Viewpoint 6: Marwood Lane, 440 m South of the Application Site

4.277 Option 1 - The proposed development would be partially visible for visual receptors at Marwood Lane above the vegetation that lines the local road and the A30. Parts of the proposed development would be screened from view by the vegetation and landform of the intervening ground but large parts of the buildings and external elements would be partially visible in the oblique views north for the transient visual receptors passing along the road. The proposed development would cause a medium change to views along Marwood Lane. This would result in a minor adverse effect upon the low sensitivity visual receptors with transient views.

4.278 Option 2 - The proposed development would be partially visible for visual receptors at Marwood Lane above the vegetation that lines the local road and the A30. Parts of the proposed development would be screened from view by the vegetation and landform of the intervening ground but large parts of the buildings would be partially visible in the oblique views north for the transient visual receptors passing along the road. The proposed development would cause a medium change to views along Marwood Lane. This would result in a minor adverse effect upon the low sensitivity visual receptors with transient views.

Viewpoint 7: Long Lane at South-Eastern Corner of the Application Site

4.279 Option 1 - Visual receptors travelling along this section of Long Lane would have clear views of the proposed development. The broad side of industrial scale buildings would be seen in close range views as visual receptors pass the Application Site. The context of the view for receptors passing the Application Site would be altered by proposed development being visible at such close range as they pass from a more rural area towards the Antiques Complex and other industrial scale buildings beyond. The proposed development would cause a large change to views for visual receptors in this location. This would result in a moderate adverse effect upon the low sensitivity visual receptors.

4.280 Option 2 - Visual receptors travelling along this section of Long Lane would have clear views of the proposed development. The broad side of industrial scale buildings would be seen in close
range views as visual receptors pass the Application Site. The context of the view for receptors passing the Application Site would be altered by proposed development being visible at such close range as they pass from a more rural area towards the Antiques Complex and other industrial scale buildings beyond. The proposed development would cause a large change to views for visual receptors in this location. This would result in a moderate adverse effect upon the low sensitivity visual receptors.

**Viewpoint 8: Long Lane at South-Western Corner of the Application Site**

4.281 Option 1 - Similarly to the south-eastern corner of the Application Site, the proposed development would be visible in close range views for visual receptors travelling along this section of the road. The context of the view for receptors passing the Application Site would be altered by the industrial scale development being visible at such close range. The proposed development would cause a large change to views for visual receptors in this location. This would result in a moderate adverse effect upon the low sensitivity visual receptors.

4.282 Option 2 - The proposed development would be visible in close range views for visual receptors travelling along this section of the road. The context of the view for receptors passing the Application Site would be altered by the industrial scale development being visible at such close range. The proposed development would cause a large change to views for visual receptors in this location. This would result in a moderate adverse effect upon the low sensitivity visual receptors.

**Viewpoint 9: Antiques Complex off Long Lane, 190m West of the Application Site**

4.283 Option 1 - The proposed development would be entirely screened from view for visual receptors in the westerly units of the Antiques Complex. There would be no change to views for visual receptors at this location. This would not result in any effect upon the low sensitivity receptors.

4.284 Option 2 - The proposed development would be entirely screened from view for visual receptors in the westerly units of the Antiques Complex. There would be no change to views for visual receptors at this location. This would not result in any effect upon the low sensitivity receptors.

**Viewpoint 10: Business Park at Exeter International Airport, 750 m West of the Application Site**

4.285 Option 1 - The proposed development to the east would be mainly screened from view from the eastern edge of the Business Park and Hotel. However, the tops of the large buildings would be seen above the existing development and vegetation at the Antiques Complex. Where visible, the proposed development would be seen against the skyline above the woodland at Rockbeare Manor Estate that forms the backdrop to the view. The proposed development would cause a medium change to views. This would result in a minor adverse effect upon the low sensitivity receptors at Exeter International Airport Business Park.

4.286 Option 2 - The proposed development to the east would be mainly screened from view from the eastern edge of the Business Park and Hotel. However, the tops of the large buildings and external elements would be seen above the existing development and vegetation at the Antiques Complex. Where visible, the proposed development would be seen against the skyline above the woodland at Rockbeare Manor Estate that forms the backdrop to the view. The proposed
development would cause a medium change to views. This would result in a minor adverse effect upon the low sensitivity receptors at Exeter International Airport Business Park.

**Viewpoint 11: A30 Overbridge on the B3184, 1 km South-West of the Application Site**

4.287 Option 1 - The proposed development would be partially visible where it is seen within the context of the existing development of the Business Park in the foreground and the Antiques Complex to the north-east. Visual receptors passing along the B3184 would have some fleeting views of the highest part of the proposed development as they pass along the bridge that allows glimpsed views to the north-east. Only the very highest parts of the development would be seen above the existing elements of the view, where it would cause a small change to the glimpsed views. This would result in a negligible adverse effect upon the low sensitivity receptors.

4.288 Option 2 - The proposed development would be partially visible where it is seen within the context of the existing development of the Business Park in the foreground and the Antiques Complex to the north-east. Visual receptors passing along the B3184 would have some fleeting views of the highest part of the proposed development as they pass along the bridge that allows glimpsed views to the north-east. Only the very highest parts of the development would be seen above the existing elements of the view, where it would cause a small change to the glimpsed views. This would result in a negligible adverse effect upon the low sensitivity receptors.

### Cumulative Impacts

4.289 The cumulative effect of other development in combination with the proposed development may have an effect on the perception of the landscape character or on views. Similar to landscape effects, cumulative landscape effects can be direct or indirect. This can be on either the physical fabric of the landscape or on the character. Cumulative effects upon visual amenity can be experienced either from static viewpoints where when more than one development is viewed in a 75 degree arc of view at the same time (intervisibility) or in succession along a route (sequentially). The developments identified for consideration are shown on Figure 2.9 and listed in Appendix 2.2.

### Cumulative Landscape Effects

4.290 In relation to Landscape effects, the developments shown in Table 4.2 have been identified as having the potential to impact cumulatively with the proposal and have therefore been examined as part of the assessment.

**Table 4.2: Developments Identified for Cumulative Landscape Impacts**

<table>
<thead>
<tr>
<th>Planning Reference</th>
<th>Development</th>
<th>Status</th>
<th>Distance</th>
<th>Character Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>16/1578/MFUL</td>
<td>Proposed Industrial unit, roadways,</td>
<td>Planning Application</td>
<td>Approx 0.2 km to the west of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
<tr>
<td></td>
<td>parking and infrastructure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning Reference</td>
<td>Development</td>
<td>Status</td>
<td>Distance</td>
<td>Character Areas</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------</td>
<td>-----------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>15/0046/MOUT</td>
<td>Cranbrook Housing Expansion Site South</td>
<td>Planning Application</td>
<td>Approx. 0.9 km to the north of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
<tr>
<td>16/0693/MRES 10/2184/MOUT</td>
<td>Distribution Warehouse</td>
<td>Approved</td>
<td>Approx. 2.2 km to the north-west of the converter station</td>
<td>3C. Sparsely settled farmed valley floors 3E. Lowland plains</td>
</tr>
<tr>
<td>15/0045/MOUT</td>
<td>Cranbrook Housing Expansion Site West</td>
<td>Planning Application</td>
<td>Approx. 1.8 km to the north-west of the converter station</td>
<td>3C. Sparsely settled farmed valley floors 3E. Lowland plains</td>
</tr>
<tr>
<td>16/1007/MRES</td>
<td>Cranbrook Housing Expansion</td>
<td>Planning Application</td>
<td>Approx. 1.9 km to the north of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
<tr>
<td>14/2137/MRES</td>
<td>Cranbrook Housing Expansion and sports pitches</td>
<td>Approved</td>
<td>Approx. 2 km to the north of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
<tr>
<td>16/1895/MRES</td>
<td>Public House</td>
<td>Planning Application</td>
<td>Approx. 1.9 km to the north of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
<tr>
<td>15/0047/MOUT</td>
<td>Cranbrook Housing Expansion Site East</td>
<td>Planning Application</td>
<td>Approx. 2.6 km to the north-east of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
<tr>
<td>15/0123/MFUL</td>
<td>Solar Farm</td>
<td>Approved</td>
<td>Approx. 4.2 km to the south-west of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
<tr>
<td>14/2761/MOUT</td>
<td>900 Houses</td>
<td>Approved</td>
<td>Approx. 3 km to the north-west of the converter station</td>
<td>3B. Lower rolling farmed and settled valley slopes 3C. Sparsely settled farmed valley floors</td>
</tr>
<tr>
<td>Planning Reference</td>
<td>Development</td>
<td>Status</td>
<td>Distance</td>
<td>Character Areas</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------------</td>
<td>-----------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
</tbody>
</table>
| 12/1515/MOUT       | Industrial Units                     | Approved        | Approx. 2.6 km to the north-west of the converter station | 3B. Lower rolling farmed and settled valley slopes  
                                                                      |                                                               | 3C. Sparsely settled farmed valley floors                                      |
| 14/2945/MOUT       | Mixed Use                            | Planning Application | Approx. 2.4 km to the north-east of the converter station | 3E. Lowland plains                                      |
| 13/1390/MFUL       | Solar Farm                           | Approved        | Approx. 2.8 km to the south-east of the converter station | 3B. Lower rolling farmed and settled valley slopes                                      |
| 14/1443/MFUL       | Wood Gassification Plant             | Approved        | Approx. 2.2 km to the south-west of the converter station | 3E. Lowland plains                                      |
| 15/0785/MRES       | Primary Infrastructure of Cranbrook New Town | Approved | Approx. 1.9 km to the north of the converter station | 3E. Lowland plains                                      |
| 13/1752/MFUL       | Cranbrook Housing Expansion          | Under Construction | Approx. 1.9 km to the north of the converter station | 3C. Sparsely settled farmed valley floors  
                                                                      |                                                               | 3E. Lowland plains                                      |
| 09/1107/MOUT       | Science Park and Hotel               | Under Construction | Approx. 3.7 km to the north-west of the converter station | 3C. Sparsely settled farmed valley floors                                      |
| 13/0001/MOUT       | 350 Houses and Public Space          | Under Construction | Approx. 4.6 km to the north-west of the converter station | 3B. Lower rolling farmed and settled valley slopes  
<pre><code>                                                                  |                                                               | 3C. Sparsely settled farmed valley floors                                      |
</code></pre>
<table>
<thead>
<tr>
<th>Planning Reference</th>
<th>Development</th>
<th>Status</th>
<th>Distance</th>
<th>Character Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/1291/MOUT</td>
<td>930 Houses and Infrastructure</td>
<td>Under Construction</td>
<td>Approx. 3.6 km to the west of the converter station</td>
<td>3B. Lower rolling farmed and settled valley slopes 3C. Sparsely settled farmed valley floors</td>
</tr>
<tr>
<td>Skypark</td>
<td>Office and Industrial Development</td>
<td>Under Construction</td>
<td>Approx. 1.8 km to the north-west of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
<tr>
<td>13/0365/MOUT</td>
<td>80 Houses</td>
<td>Under Construction</td>
<td>Approx. 3.6 km south west of the converter station</td>
<td>3E. Lowland plains</td>
</tr>
</tbody>
</table>

4.291 The converter station would be situated within the same landscape character area (Character Area 3E: Lowland Plains) as a number of committed projects - those developments that are consented and/or under construction. The FAB Link Interconnector UK Converter Station would contribute to an incremental increase in the developed nature of the Lowland Plains character area.

4.292 The scale of the Converter Station would not be out of character with the industrial scale of committed developments near to Exeter International Airport (Skypark and the Intermodal Freight Facility) and would contribute to the move away from the dominance of stone as a building material for development in this part of the Lowland Plains Character Area.

4.293 The Converter Station in combination with the committed developments would contribute to a reduction in the sense of remoteness that is characteristic of the Lowland Plains Character Area and would cause a small cumulative change to the medium sensitivity Character Area. This would result in a moderate adverse cumulative effect.

4.294 Planning applications have been submitted for number of other major developments also located within Landscape Character Area 3E: Lowland Plains, including a further expansion of housing and mixed use development connected with the Cranbrook new community to the south and east of the current build.

4.295 If all of the above major applications are approved, the Converter Station in combination with those major 3rd party developments would contribute to increased modern development in the Lowland Plains. The Converter Station would add to the large number of projects that are reducing the sense of remoteness still experienced in parts of the Character Area and would cause a small cumulative change to the Lowland Plains. This would result in a moderate adverse cumulative effect.
Cumulative Visual Effects

Inter-visibility

4.296 The converter station would be seen in some of the same views as committed developments. The proposed converter station development would be seen in the context of the industrial scale development to the north-east of the Site and residential development to the north. Where views of the converter station are available, it would appear amongst the influences of the existing development and development that is currently under construction where it would cause a small cumulative change. This would result in a negligible adverse cumulative effect upon the low sensitivity receptors travelling on roads and within commercial premises. It would result in a moderate adverse cumulative effect upon the high sensitivity receptors within residential properties and on public rights of way.

4.297 The converter station would be seen within the context of increasingly urbanised views that are characterised by large scale industrial development and large areas of residential development for which planning applications have been submitted. The converter station would be seen amongst the large industrial buildings and large residential expansions in the vicinity of Exeter International Airport where it would appear as a subsidiary proportion of the large amount of development that is visible. The converter station would cause a small cumulative change to views where it is seen alongside any of the committed development. This would result in a negligible adverse cumulative effect upon the low sensitivity receptors travelling on roads and within commercial premises. It would result in a moderate adverse cumulative effect upon the high sensitivity receptors within residential properties and on public rights of way.

Sequential Visibility

4.298 Some visual receptors travelling a longer distance along some of the linear routes that allow views of the converter station may also gain views of other committed developments. Where this occurs, the converter station would be seen in the context of industrial scale development and would cause a small cumulative change to views from routes. This would result in a negligible adverse cumulative effect upon the low sensitivity receptors travelling on roads. It would result in a moderate adverse cumulative effect upon the high sensitivity receptors on public rights of way.

4.299 If all of the above major applications are approved, such visual receptors would witness views of the converter station as well as many of the proposed developments. The converter station would be seen as part of a sequence of urbanising development and would cause a small cumulative change to the sequential views that it is seen in. This would result in a negligible adverse cumulative effect upon the low sensitivity receptors travelling on roads. It would result in a moderate adverse cumulative effect upon the high sensitivity receptors on public rights of way.

Summary

4.300 The proposed development would cause the modification of the Application Site from an agricultural field to a converter station which would bring a complete change in character to the Application Site. However, the proposed development would not appear out of context with existing development in the local area such as that at the adjacent Antiques Complex, the development associated with Exeter International Airport and the Business Park. The proposed
development would not constitute a noticeable change to the character of the wider landscape such as the district and county landscape character areas. It is within the capacity of the local and wider landscape to absorb this type of development.

4.301 Close range views for a number of visual receptors would be modified by the industrial scale development where it would be visible in the relatively unremarkable local views. Much of the visual envelope for many receptors is already influenced by the industrial scale of development in the local area. The close range receptors would witness the largest change to the visual baseline as the proposed development would form a noticeable and prominent element for some receptors. However, the proposed development would have much less of an influence over longer range views such as those from the more elevated ground at Ashclyst where it would be seen as part of the existing development clustered around Exeter International Airport.

4.302 The cut and fill process to level the Application Site would sink the building on the southern part of the Site but raise it in the northern section, requiring cutting and embankments to return the ground to its natural levels at the Site boundaries. Mitigation planting would be implemented on the available land between the operational boundary of the proposed development and the existing field boundaries. There is the opportunity to make the proposed development less visually intrusive by selecting appropriate exterior colours and the most appropriate fencing type.

4.303 Over time, the mitigation planting and local vegetation would mature to provide a significant level of visual screening for the proposed development that would help it to assimilate into the views better and become less prominent. By adding a soil bund to the eastern side of the Application Site, the effect of the mitigation planting would be enhanced.

4.304 Whilst there is other consented and proposed development in the area that would give rise to cumulative impacts on landscape and visual receptors in combination with the proposed converter station, none of those effects would be greater than moderate adverse.
References


Devon County Council (2012) Devon’s Landscape Character Assessment


5 Archaeology and Cultural Heritage

Introduction

5.1 This chapter appraises the likelihood of archaeology and cultural heritage resource impacts from the proposed FAB Link HVDC converter station development near Exeter Airport. This chapter draws on relevant guidance and consultation to inform the appraisal and sets out the proposed measures to mitigate any potential adverse impacts.

5.2 In this chapter, cultural heritage resources are collectively referred to as 'heritage assets'. This chapter identifies the likely impacts on these heritage assets in terms of the potential for direct physical disturbance and changes within the settings of the assets and assesses the overall significance of effect.

Assessment Methodology

Relevant Legislation and National Policy

5.3 Legislative frameworks provide protection to the historic environment while planning policy guidance provides advice concerning how the historic environment should be addressed within the planning process.

5.4 Statutory protection for archaeology is principally enshrined in the Ancient Monuments and Archaeological Areas Act (1979) amended by the National Heritage Act (1983) and the National Heritage Act (2002). Nationally important archaeological sites are listed in a Schedule of Monuments and are accorded statutory protection.

5.5 Historic Parks and Gardens, and Historic Battlefields, have received recognition under the National Heritage Acts. Such sites are described on Registers maintained by Historic England for DCMS, but such designation does not afford statutory protection.

5.6 For other components of the historic environment, the Planning (Listed Buildings and Conservation Areas) Act (1990) and the Town and County Planning Act (1971) provide statutory protection to listed buildings and their settings and present measures to designate and preserve the character and appearance of Conservation Areas.

5.7 The Hedgerow Regulations (HMSO 1997) includes guidelines that aim to protect hedgerows which have been assessed as 'important' in terms of criteria that incorporate historical components. One of these criteria relates to the documented date of a hedgerow. A hedgerow can be deemed 'important' if it can be shown to be of pre-enclosure date, which for the purposes of the Regulations is currently taken (by case law precedent) to mean pre-AD 1845 (the earliest Act of Inclosure recorded in the Small Titles Act (1896)). Developments that would require the removal of any part of an 'important' hedgerow require consent from the Local Planning Authority for that removal.

5.8 Proposed amendments to the Regulations (DEFRA 2003) stated that 'hedgerows should be regarded as 'important' if they mark a boundary of pre-1850 historic administrative unit (parish, township, hundred, wapentake, cantref or maerdref) or pre-1600 manorial estate, ecclesiastical
estate, or the outer limits of a field system, park, wood or common land’. However these amendments have not yet been agreed as statute law.

5.9 The National Planning Policy Framework (NPPF; March 2012) includes advice concerning the safeguarding of the historic environment within the planning process. Paragraph 128 of the NPPF directs local planning authorities to ‘require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.’

5.10 In Annex 2 of the NPPF, a heritage asset is defined as ‘A building, monument, site, place or landscape positively identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage asset includes designated heritage assets and assets identified by the local planning authority (including local listing)’.

5.11 Paragraph 133 of the NPPF states that ‘Where a proposed development will lead to substantial harm or total loss of significance of a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss ….’ The NPPF goes on to state that ‘Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal ….’

5.12 Paragraph 135 of the NPPF advises that ‘The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.’

5.13 The strong message emerging from the NPPF is that it is the effect of proposed development on the significance of the heritage asset that is the principal concern, rather than the effect on the asset itself.

Consultation

Table 5.1: Consultation Responses Relevant to this Chapter

<table>
<thead>
<tr>
<th>Date</th>
<th>Consultee and Issues Raised</th>
<th>How/ Where Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>11th April 2016</td>
<td>Devon County Council Historic Environment Team (HET)</td>
<td>All available sources of baseline information have been examined (paragraphs 5.29 - 5.63 of this chapter).</td>
</tr>
</tbody>
</table>
HET confirmed that a geophysical survey of the application site for the converter station and also the associated temporary compound area would be required, in line with the Written Scheme of Investigation that has already been agreed. The geophysical survey has been undertaken – results are discussed in paragraph 5.60 of this chapter, see also Figure 5.8.

Methodology

5.14 Data regarding known heritage assets (designated and undesignated) have been sought from a number of sources, including the Devon Historic Environment Record (HER) maintained by Devon County Council, the National Heritage List for England (maintained by Historic England) and the Devon Archives and Local Studies Service (Exeter). A site visit was undertaken in order to check for the presence of heritage assets within and adjacent to the Site that have not been previously recorded and in order to assess the current settings of designated heritage assets that could be affected by the proposed development.

5.15 The overall aim of this heritage assessment is to ensure compliance with paragraph 128 of the NPPF, i.e. to describe the significance of any heritage assets affected by the proposed development, including any contribution made by their setting. In the NPPF ‘significance’ is defined as: ‘The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic’ (Annex 2: Glossary).

5.16 These levels of interest broadly tie in with previous guidance from English Heritage expressed in the document Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (EH 2008). This provided guidance on understanding heritage values and also included a section (Section 6) advising on how to assess heritage significance.

5.17 According to the guidance published by English Heritage (2008), heritage values fall into four inter-related groups:

- Evidential value – the potential of a place to yield evidence about past human activity;

- Historical value - this derives from the ways in which past people, events and aspects of life can be connected through a place to the present. This value tends to be illustrative (providing insights into past communities and their activities) or associative (association with a notable family, person, event or movement);

- Aesthetic value – this derives from the ways in which people draw sensory and intellectual stimulation from a place; and

- Communal value – this derives from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory.
5.18 East Devon District Council has produced a web-based guidance note regarding the Assessment of Significance for listed buildings: [http://eastdevon.gov.uk/planning/planning-permission/apply-for-planning-permission/listed-building-consent/statement-of-significance-guidance-notes-for-listed-buildings/](http://eastdevon.gov.uk/planning/planning-permission/apply-for-planning-permission/listed-building-consent/statement-of-significance-guidance-notes-for-listed-buildings/). This provides advice on the nature and level of information that should accompany applications for listed building consent and for planning permission for developments affecting heritage assets.

5.19 The definition of the setting of a heritage asset is provided in Annex 2 of the NPPF: ‘The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.’

5.20 The most recent guidance regarding the settings of heritage assets, and the nature and magnitude of impacts and consequently effects on such settings, is provided in the Historic England document [Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (July 2015)](http://www.historicenvironment.org.uk/planning/). This guidance provides advice on the definition of setting and the general principles of setting in the context of strategic planning and development control. It states (paragraph 2) that ‘the information required in support of applications for planning permission and listed building consents should be no more than is necessary to reach an informed decision, and that activities to conserve or invest need to be proportionate to the significance of the heritage assets affected and the impact on the significance of those heritage assets. At the same time those taking decisions need enough information to understand the issues.’

5.21 The Historic England guidance document makes the following points:

- Extensive heritage assets such as landscapes or townscapes can include many heritage assets and their nested and overlapping settings, as well as having a setting of their own;

- The setting of a heritage asset may reflect the character of the wider townscape or landscape in which it is situated, whether fortuitously or by design;

- The importance of a setting of a heritage asset is what it contributes to the significance of the asset;

- Where the significance of a heritage asset has been compromised in the past by unsympathetic development within its setting, consideration still needs to be given as to whether additional change will further detract from (or possibly enhance) the significance of the asset;

- The contribution made by its setting to the significance of a heritage asset does not depend on public access; and

- Heritage assets that comprise only buried archaeological remains have a setting, although this may not be readily appreciated by a casual observer.
5.22 The document goes on to provide advice on a staged approach to decision-taking by outlining a five-stage approach:

1. Identify which heritage assets and their settings are affected;

2. Assess whether, how and to what degree these settings make a contribution to the significance of the heritage asset(s);

3. Assess the effects of the proposed development, whether beneficial or harmful, on that significance;

4. Explore the way to maximise enhancement and avoid or minimise harm; and

5. Make and document the decision and monitor outcomes.

5.23 Although assessments of changes within the settings of heritage assets can involve non-visual issues such as noise, it is more usually the visual aspects of a development that form the major part of the assessment.

5.24 The existence of direct lines of sight between the heritage asset and the proposed development is an important factor in judging the visual impact of the development. However it is possible for changes within the setting to occur even when such a relationship does not exist. For example, views towards a listed building from a frequently visited location, such as a park or a public footpath, may be affected by the presence of a larger development, even if the development is not directly visible from the building itself.

5.25 An assessment of visual impacts on the heritage assets and their settings needs to take into account a wide variety of factors including the location of the asset within the physical landscape, its relationship with contemporary and non-contemporary features within that landscape and the location, size and character of the proposed development in relation to these factors.

5.26 The assessment then needs to balance the impact of these various considerations on the basis of informed professional judgment. Assessment of visual impacts is undertaken in accordance with the procedures expressed in the Guidelines for Landscape and Visual Impact Assessment (3rd Edition, Landscape Institute 2013). If there is the potential for changes within the setting of heritage assets due to noise or other impacts than these would be considered using appropriate procedures.

5.27 There should also be consideration of the sensitivity to change of the setting of a heritage asset. This requires examination of the current setting with regard to identifying elements that contribute to the significance of the asset, elements that make a neutral contribution to the significance of the asset and elements that make a negative contribution to (i.e. detract from) the significance of the asset.
Limitations of the Assessment

5.28 No limitations have been identified with regard to the assessment presented within this chapter. All known and available sources of baseline data have been examined and the assessment is robust.

Assessment

Baseline environment

5.29 A gazetteer of identified heritage assets is presented as Appendix 5.1 of this Environmental Report and the assets are shown on Figures 5.1 to 5.6 as Sites 001 - 041.

5.30 In order to understand the potential for the application site and the temporary compound area to contain buried archaeological remains, examination was made of the Devon Historic Environment Record (HER). Data were acquired and examined for an extensive area in order to provide advice regarding cable route and converter station options, however for the purposes of the current report the study area with regard to buried archaeology is a buffer zone extending approximately 200 m from the red line boundary for the application.

5.31 There is no fixed study area with regard to the assessment of potential effects resulting from change within the setting of heritage assets. All assets for which an adverse effect is considered possible are identified below.

5.32 The nearest designated heritage asset to the application site is the Grade II listed Lower Southwood Farmhouse and adjoining Lower Southwood Cottage (001). This was originally one house and is of early 17th century date, although the cottage incorporates part of a late 19th century coach house. This property is located approximately 400m east of the application site.

5.33 To the north-east of Higher Southwood and approximately 830m north-east of the application site is a pair of Grade II listed cottages; Nos. 1 and 2 Little Silver, adjacent to Silver Lane (002). These are probably of early 19th century date and are constructed in plastered cob on stone footings with thatched roofs. Just to the north of this pair of cottages is another Grade II listed cottage known as The Nook, which is of mid–late 17th century date (003).

5.34 Approximately 900m to the east of the application site is the Grade II Registered Historic Park and Garden of Rockbeare Manor (004). The landscaped park was established in the late 18th or early 19th century and includes c. 10 hectares of pleasure grounds around the principal house (in the eastern side of the park) and a further 50 hectares of parkland and woodland with a serpentine lake.

5.35 Rockbeare Manor itself is a Grade I listed building of mid-late 18th century date and is a good example of a Regency period country house (005). The principal façade of the house faces west-north-west, whilst the application site is located approximately 1500m to the west-south-west. The adjacent stable/coach house is listed at Grade II* (006), a courtyard of farm buildings to the east of the stable/coach house is listed at Grade II (007) as is a group comprising gateposts, gates and railings at the eastern edge of the park adjacent to Rag Lane (008). To the south of the principal house the walls around a shrubbery are listed at Grade II (009) and the gate piers and gates to the north at the main entrance to the estate are listed at Grade II* (010).
5.36 Just to the north-west of the registered historic park is the Grade II listed Lions Farmhouse (011); this has a date plaque of 1696 and was modernised and extended in the late 19th century. To the north-east, and north of the road leading from Rockbeare to Marsh Green, is another Grade II listed farmhouse – Ford Farmhouse (012) – and a Grade II listed former rectory (013). Ford Farmhouse is approximately 1.75km north-east of the application site.

5.37 To the north-west of the application site and on the other side of the main airport runway is the Grade II listed Treasbeare Farmhouse (014). This is possibly of early 16th century date with later improvements and amendments. The older part of the L-shaped property faces west and is now in service use. The earliest documentary reference to Treasbeare is from AD 928 and the farm was the property of the Dean and chapter of Exeter Cathedral from around the 11th century until 1983, resulting in a wealth of documentary information.

5.38 Approximately 1.4km to the south of the application site is the Grade II listed Farringdon House, an early 18th century mansion remodelled at the end of the 19th century (015). The gate posts at the end of the drive formerly leading to Farringdon House are also Grade II listed (016), however the drive now provides access to 20th century residential development and the main house has a separate access off the B3184 road.

5.39 There are clusters of listed buildings in the surrounding villages of Rockbeare, Marsh Green, Aylesbeare, Farringdon and Clyst Honiton.

5.40 Approximately 7.3km north-west of the application site is the Grade II* Registered Historic Park and Garden at Killerton House (017). The 17th century principal house here is Grade II* listed along with the ha-ha across the entrance front (018). The Chapel of the Holy Evangelists was formerly the private chapel of the Acland family and is a Grade I listed building (019), whilst a summer house in the park (known as the Bear’s Hut) is Grade II* listed (020). There are also two Scheduled Monuments within the Registered Park and Garden at Killington: a univallate prehistoric hillfort and associated enclosure known as Dolbury (021); and two lengths of post-medieval deer park pale along with a watering pond (022).

5.41 The closest Conservation Area is at Broadclyst, approximately 4.4km north-west of the application site (023). The designated area is at the northern end of the settlement and predominately represents the former estate village of the Aclands family, based initially at Columbjoth and subsequently at Killerton. The former estate village is now largely owned by the National Trust. Key buildings include the Grade I listed Church of St John the Baptist (024) and the Grade II listed Red Lion Inn (025). A stone cross (026) in the churchyard is a Scheduled Monument (and a Grade II listed building), whilst the remains of a manorial settlement north of the church are also Scheduled and include the well-preserved undercroft of a manor house (027).

5.42 The earliest map to show the application site in any level of detail is the 1801 Ordnance Survey Drawing (OSD) for Ottery St Mary (Figure 5.3). This shows the lane or minor road along the southern boundary of the application site. However the field pattern within this area is not the same as the present layout, although the fields are medium-sized and predominantly straight-sided as they are today. Buildings are shown at the sites of Higher and Lower Southwood and this location is named on the map as South Wood. To the south-west and on the southern side
of the road between Clyst Honiton and Aylesbeare is another group of buildings marked as Dairy House; this is the current location of Wares Farm. To the east of Dairy House is a smaller single building which is not named on the OSD.

5.43 The Rockbeare Tithe Map of 1844 shows a field layout that has continued to the present day, albeit with some subsequent boundary loss (Figure 5.4). The western boundary of the proposed temporary compound area is the parish boundary (as it is today), with the parish of Rockbeare to the east and the parish of Clyst Honiton to the west. There are a number of ponds including examples within the defined study area. Such ponds are common in this area and often represent extraction pits (for marl) which have subsequently flooded. Two of these ponds or former extraction pits are located to the north of the application site (028); aerial photographs of immediate post-WWII date show a levelled earthwork bank here that may indicate infilling of the former pits or may represent a feature associated with the military use of the airfield during WWII (see below). A second example of a probable former extraction pit is recorded on aerial photographs and is located south-east of the application site (029).

5.44 The 1st edition Ordnance Survey 6” to the mile map was published in 1889 (Figure 5.5). It shows that there are no buildings within either the application site or the adjacent field to the west which would be the temporary compound area. There is a small pond on the boundary between the two fields, with another within the western field and a third one on the northern boundary of the same field. Just to the west a couple of ponds are marked as ‘Old Marl Pit’, so it is possible that those within or directly adjacent to the application site had a similar origin as suggested above.

5.45 East of the application site the two farms at Higher and Lower Southwood are depicted with their adjacent orchards. To the south-west is Wares Farm (formerly Dairy House) whilst the smaller building to the east of Wares Farm is named on this map as ‘Beautiport’.

5.46 The situation depicted on the 2nd edition of the same map, published in 1906, shows no changes within or adjacent to the application site. The major change in the area happened with the establishment of Exeter Airport to the west of the development site (and immediately east of the village of Clyst Honiton).

5.47 The airport opened in 1937 with commercial flights to Jersey and also to other UK airports including Plymouth and Bristol. It was constructed by the Exeter Corporation following the compulsory purchase of the land and was leased to Exeter Airport Ltd.

5.48 Exeter Airport was taken over by the Air Ministry in 1939 and the landing area was expanded. It was formally passed to the RAF in 1940 and was used as an operational fighter plane base, initially using the Hurricanes of 213 Squadron. It subsequently became part of Fighter Command. New hard runways were constructed along with a Bellman hangar and several dispersed fighter pens. A number of Blister hangars were added later in the war.

5.49 Enemy raids on the airport were frequent and many aircraft and buildings were damaged. Bomb craters around the airfield are visible on contemporary aerial photographs and are recorded on the HER. A number of ‘dispersed sites’ were established around the periphery of the airport which provided accommodation and associated facilities for personnel.
5.50 In the spring 1944 the airport was transferred to the USAAF and was the base for C47 Dakotas of the 440th Troop Carrier Group. These planes were used to transport paratroopers from the 101st Airborne Division into northern France following the D-Day landings. By October 1944 the airport was not required for USAAF service and was returned to the RAF.

5.51 The airport was transferred to the Ministry of Civil Aviation in at the beginning of 1947 and was used by the aircraft manufacturer Chrislea Aircraft Ltd, subsequently C.E. Harper Aircraft Ltd. Military reserve units were established in 1949 (ahead of the Korean War) but were disbanded in 1954. Civilian passenger flights recommenced in 1952 and the airport has continued to develop with many new routes established. A new arrivals building was opened in 1999 and a new departure lounge in 2003.

5.52 Many of the entries on the Devon HER within the defined study area relate to the development and use of the airfield during WWII (Figure 5.6). Part of what was known as Dispersed Site 4 (030) is actually within the application site. Elements of this Dispersed Site that were within the application site included: the Sergeants’ Quarters (031); a picket post with sleeping quarters (032); 4 no. barracks huts (033); and 4 no. latrine blocks and drying rooms (034). All of the built elements of this Dispersed Site had been cleared by 1966.

5.53 Immediately to the west of the application site was Dispersed Site 2 (035), which included an Officers’ Mess, latrines, ablutions block, mess building, ration stores, Romney huts, Airmen’s Institute, and another picket post. Some elements of this Dispersed Site are still extant within the small business park here.

5.54 Dispersed Site 3 (036) extended around the northern boundary of the application site. It contained barrack huts, a compressor house, latrine blocks and drying rooms and a sentry box. No elements of this Dispersed Site have survived. Dispersed Site 7 was to the south-west, outside the defined study area, but the recreation ground (037) associated with this Dispersed Site was located to the south of the application site. Other isolated structures for military use were located within the western part of the defined study area, none of which survive.

5.55 To the east of the application site was Dispersed Site 5 (038). This contained a number of nissen huts and other structures, also possible air raid shelters. Aerial photographs indicate a trench connecting this Dispersed Site to Dispersed Site 2, probably for a communications cable. This trench crosses the application site on a north-east/south-west alignment.

5.56 Dispersed Site 8 (039) was located south of Dispersed Site 5, south-west of Southwood Cross. This contained nissen huts and other structures, also possible sewage tanks. This dispersal Site had been largely cleared by 1966, although at least two structures are still extant close to the A30 road. Just to the north of this Dispersal Site the Devon HER records the location of a pillbox (040), with another potential example immediately west of Dispersed Site 5 (041). The condition of these two structures is not currently known.

5.57 A programme of Historic Landscape Characterisation (HLC) has been undertaken for Devon and the results are available via the Devon County Council website. HLC is an aspect of more general landscape characterisation that seeks to provide an additional element of ‘time-depth’, allowing the historic evolution of the landscape to be perceived and understood.
5.58 For the Modern layer of the HLC, land within the application site falls into a single defined HLC type: *Barton fields* (Figure 5.7). These are defined as relatively large, regular enclosures that were likely to have been laid out in the period of the 15th to 18th centuries. Post-medieval boundary loss is recorded as 0%.

5.59 Examination of the historic mapping, specifically the 1801 OSD map (Figure 5.3) and the 1844 Rockbeare Tithe Map (Figure 5.4), indicate that the field layout within and in the vicinity of the application site was amended in the early part of the 19th century. An enclosure award is known for Rockbeare Hill and March Green, but this is dated to 1849 and therefore post-dates the Tithe Map; it may have applied to parts of the parish outside the study area. However the conclusion must be that the fields recorded on the 1844 Tithe Map (with some subsequent boundary loss) cannot realistically be genuine Barton Fields as proposed by the HLC but are in fact the result of early 19th century enclosure and reorganisation of the landscape. A more applicable HLC type would be *Modern enclosures*.

5.60 An archaeological geophysical survey of the application site and the adjacent temporary compound area was undertaken in April 2016 (Stratascan 2016). This survey clearly identified the line of the wartime cable between the airfield Dispersed Sites 4 and 5, along with a second modern service in the western side of the temporary compound area site (Figure 5.8). A service adjacent to the road to the south of the application site and the temporary compound area is known to be a water pipe.

5.61 A number of linear features probably represent former field boundaries, although one is on an alignment that does not fit with the present field pattern or the preceding one. Areas of disturbance were noted and these correlate with the location of built elements of the airfield Dispersed Site 4. The former locations of two ponds were also identified, along with a third one not known from the historic mapping of the area.

**Designed-in Mitigation**

5.62 Some screening of the proposed development will be provided through the provision of earth bunds around the perimeter, planted with trees and shrubs. The landscape plan (Figure 2.7) shows bunds topped with trees on the eastern and northern sides of the application site, and bunds topped with shrubs on the southern and western sides of the proposed converter station.

5.63 This proposed screening through the use of earth bunds and vegetation would provide some mitigation with regard to visual impacts of the proposed development that represents changes within the settings of heritage assets.

**Assessment of Construction Impacts**

5.64 A detailed description of the proposed development is presented in Chapter 2 of this report. The converter station is likely to have two buildings up to 20m in height, along with external plant and equipment. The buildings are typically constructed with steel frames and are likely to be clad in pre-coloured aluminium sheet. There are two potential designs for the converter station – the assessments presented below apply equally to both of these. The assessments also cover the temporary compound area adjacent to the site of the proposed converter station.
5.65 Construction impacts resulting from visual change and also noise within the settings of heritage assets are considered to be the same as for operational impacts and are considered in the following section of this chapter. It is acknowledged that construction noise would potentially exceed operational noise for key activities within the construction programme, but this would be for very short periods. Measures for the control of noise during construction are set out in the Noise and Vibration chapter (Chapter 7) and in the draft Code of Construction Practice (CoCP) presented as Chapter 11 of this report. No additional assessment has been undertaken with regard to impacts on heritage assets resulting from construction noise.

5.66 There would also be impacts during construction as a result of visual change within the settings of heritage assets such that the significance of the assets may be harmed. However, the level of effects resulting from such impacts during construction would generally be no greater than during operation and thus the assessment provided below regarding operational impacts should be applied equally to construction impacts. Where the magnitude of construction impacts could exceed operational impacts (e.g. use of cranes) then these impacts would be temporary and medium term (in overall duration). The assessment presented in the Noise and Vibration chapter (Chapter 7) indicate that there would be no impacts on heritage assets resulting from noise during construction or operation of the proposed development.

**Effects on buried archaeological remains**

5.67 Where present, buried archaeological remains within the application site would be impacted by site-based activities that involve ground breaking and ground reduction, including foundations and the installation of services. It would be possible to protect buried archaeological remains in those parts of the application site that are not subject to ground breaking and/or reduction, potentially through the use of engineered textile membranes in areas of laydown and/or materials storage, also in areas proposed for landscaping and the temporary compound area.

5.68 The desk-based assessment and geophysical survey have not identified the presence of any significant buried archaeological remains within the application site or the temporary compound area. Linear anomalies recorded by the geophysical survey are likely to represent former field boundaries, whilst other anomalies indicate disturbance associated with former ponds and with a dispersed accommodation site that was part of RAF Exeter during WWII.

5.69 On the basis of the baseline position described within this chapter it is unlikely that the proposed development would have any significant effect on buried archaeological remains.

**Assessment of Operational Impacts**

**Effects on heritage assets resulting from changes within their settings**

5.70 Operational impacts would occur as a result of visual change (and potentially increased noise) within the settings of heritage assets such that the significance of the asset is harmed. Illustrative block plans are presented as Figures 2.3 - 2.4 of this report. There are two potential designs for the converter station – the assessments presented below apply equally to both of these.
5.71 Images showing how the application site is seen from a number of locations are presented within Chapter 4 (Landscape and Visual Impact Assessment), with photomontages indicating how the proposed development would appear from several of these viewpoints presented as Figure 4.7.*.

Lower Southwood Cottage and Lower Southwood Farmhouse (Site 001)

5.72 These properties comprise a single Grade II listed building located approximately 400m east of the application site. The immediate setting of the properties comprises the farmyard just to the north and the formal garden to the south, along with additional modern farm buildings just on the other side of the road at the south end of the garden and access drive. These all provide evidence that there is still a working farm in the vicinity. There is also a wider setting in that there are views to and from the listed building from several directions, including from the application site.

5.73 The significance of the listed building is derived from all of the key values identified in Conservation Principles; evidential, historical, aesthetic and communal. The evidential and historic values are linked to the information derived from the study of the built fabric of the structure and of associated documents. There are aesthetic values associated with the visual appreciation of the historic structure and its setting. Communal values derive from current and former owners / tenants as well as local people who may have a connection with the building. The setting of the listed building makes a reasonable contribution to its significance.

5.74 There would be no views out towards the proposed development from the ground floor of the listed building, or land adjacent to it, as a result of mature vegetation adjacent to the access drive leading to the property. There would be views of the proposed development from the upper (first) floor of the listed building although there is very little fenestration on this side of the building. Views towards the proposed development already include the large industrial buildings at the Business Park adjacent to Exeter International Airport, as well as recent large developments such as the Flybe Training Academy and the Hampton by Hilton hotel. However these structures are at least 1.35km from the listed building whereas the proposed development site is 400m. Even with the planted landscape bunds which are part of the proposed development in place, the larger elements of the converter station would remain visible in views from the upper floor of the listed building.

5.75 There would be a slight loss of significance with regard to this Grade II listed building as a result of change within its wider setting.

Nos. 1 and 2 Little Silver (Site 002)

5.76 This pair of Grade II listed cottages are located approximately 830m north-east of the application site. The immediate setting of the properties comprises the adjacent road and the garden to the east. However there is also a wider setting in that there are views to and from the listed building from several directions, including from the application site.

5.77 The significance of the listed building is derived from all of the key values identified in Conservation Principles; evidential, historical, aesthetic and communal. The evidential and historic values are linked to the information derived from the study of the built fabric of the structure and of associated documents. There are aesthetic values associated with the visual
appreciation of the historic structure and its setting. Communal values derive from current and former owners / tenants as well as local people who may have a connection with the building. The setting of the listed building makes a reasonable contribution to its significance.

5.78 There would be views of the proposed development from the western façade of the listed building (although there is very little fenestration on this side of the building) and also from the ground adjacent to the listed building. Views towards the proposed development already include the large industrial buildings at the Business Park adjacent to Exeter International Airport, as well as recent large developments such as the Flybe Training Academy and the Hampton by Hilton hotel. However these structures are at least 1.75km from the listed building whereas the proposed development site is 830m. Even with the planted landscape bunds which are part of the proposed development in place, the larger elements of the converter station would remain visible in views from the listed building.

5.79 There would be a slight loss of significance with regard to this Grade II listed building as a result of change within its wider setting.

*The Nook, Silver Lane (Site 003)*

5.80 This Grade II listed cottage is located approximately 800m north-east of the application site. The immediate setting of the property comprises the adjacent road and the garden to the south. However there is also a wider setting in that there are views to and from the listed building from several directions, including from the application site.

5.81 The significance of the listed building is derived from all of the key values identified in *Conservation Principles*; evidential, historical, aesthetic and communal. The evidential and historic values are linked to the information derived from the study of the built fabric of the structure and of associated documents. There are aesthetic values associated with the visual appreciation of the historic structure and its setting. Communal values derive from current and former owners / tenants as well as local people who may have a connection with the building. The setting of the listed building makes a reasonable contribution to its significance.

5.82 There would be views of the proposed development from the upper floor of the listed building. Views towards the proposed development already include the large industrial buildings at the Business Park adjacent to Exeter International Airport, as well as recent large developments such as the Flybe Training Academy and the Hampton by Hilton hotel. However these structures are at least 1.75km from the listed building whereas the proposed development site is 800m. Even with the planted landscape bunds which are part of the proposed development in place, the larger elements of the converter station would remain visible in views from the listed building. Figure 4.6 (Viewpoint 1) shows how the proposed development could be seen from the vicinity of this listed building.

5.83 There would be a slight loss of significance with regard to this Grade II listed building as a result of change within its wider setting.

*Rockbeare Manor Registered Historic Park and Garden (Site 004)*

5.84 The Grade II Registered Historic Park and Garden of Rockbeare Manor is located approximately 900m to the east of the application site. The landscaped park extends for more than 60 hectares
and includes informal parkland and woodland with a serpentine lake. Although there is mature
vegetation within the registered park and along much of the boundary, the western edge is more
sparse and gaps in this boundary enable views out from the park in the direction of the airport
and the application site. The arable fields west of the park therefore form part of its wider setting.

5.85 The significance of the Registered Historic Park and Garden is derived from all of the key values
identified in Conservation Principles; evidential, historical, aesthetic and communal. The
evidential and historic values are linked to the information derived from the study of the physical
nature of the park and of associated documents which link the development of the park and
garden with the principal house. There are aesthetic values associated with the visual
appreciation of the park and its setting. Communal values derive from current and former owners
of the principal house and also the staff, as well as local people who may have a connection with
the manor and its grounds. The setting of the Registered Historic Park and Garden makes a
slight contribution to its significance.

5.86 There would be views of the proposed development from within the north-western part of the
Registered Historic Park and Garden. Views towards the proposed development already include
the large industrial buildings at the Business Park adjacent to Exeter International Airport, as well
as recent large developments such as the Flybe Training Academy and the Hampton by Hilton
hotel. However these structures are at least 2km from the Registered Historic Park and Garden
whereas the proposed development site is 900m. Even with the planted landscape bunds which
are part of the proposed development in place, the larger elements of the converter station would
remain visible in views from the Registered Historic Park and Garden.

5.87 There would be a slight loss of significance with regard to this Grade II Registered Historic Park
and Garden as a result of change within its wider setting.

Rockbeare Manor (Site 005)

5.88 The Grade I listed Rockbeare Manor is located approximately 1500m from the application site. It
is of mid-late 18th century date and is a good example of a Regency period country house. The
principal façade of the house faces west-north-west, whereas the application site is to the west-
south-west.

5.89 The immediate setting of the house comprises the extensive park and garden that surrounds the
house on almost all sides. This has been designed to complement the house and provides a
designed setting for the building. There is a wider setting in which there are views from, and to,
the house. The views are predominantly from the west, as mature vegetation screens the view in
all other directions.

5.90 The significance of the listed building is derived from all of the key values identified in
Conservation Principles; evidential, historical, aesthetic and communal. The evidential and
historic values are linked to the information derived from the study of the built fabric of the
structure and of associated documents. There are aesthetic values associated with the visual
appreciation of the historic structure and its setting. Communal values derive from current and
former owners / tenants and staff, as well as local people who may have a connection with the
building. The setting of the listed building makes a strong contribution to its significance.
5.91 There would be views of the proposed development from the listed building, looking across the landscaped park. Views towards the proposed development already include the large industrial buildings at the Business Park adjacent to Exeter International Airport, as well as recent large developments such as the Flybe Training Academy and the Hampton by Hilton hotel. However these structures are at least 2.5km from the listed building whereas the application site is 1.5km. Even with the planted landscape bunds which are part of the proposed development in place, the larger elements of the converter station would remain visible in views from the listed building.

5.92 There would be a slight loss of significance with regard to this Grade I listed building as a result of change within its wider setting.

5.93 No effects are predicted on the adjacent Grade II* listed stable/coach house (Site 006), the Grade II listed courtyard of farm buildings east of the stable/coach house (Site 007), a Grade II listed group of gateposts, gates and railings adjacent to Rag Lane (Site 008), a Grade II listed group of walls around a shrubbery (Site 009) or the Grade II* listed gate piers and gates at the main entrance to the estate (Site 010). In each case this is due to the presence of intervening buildings and/or mature vegetation, resulting in there being no intervisibility between the listed structures and the application site.

Lions Farmhouse (Site 011)

5.94 The Grade II listed Lions Farmhouse is located approximately 1.3km north-east of the application site. The immediate setting of the listed building comprises the farmyard to the east, along with additional modern farm buildings just beyond the farmyard. There is also a wider setting in that there are views to and from the listed building from several directions, principally the south and west.

5.95 The significance of the listed building is derived from all of the key values identified in Conservation Principles; evidential, historical, aesthetic and communal. The evidential and historic values are linked to the information derived from the study of the built fabric of the structure and of associated documents. There are aesthetic values associated with the visual appreciation of the historic structure and its setting. Communal values derive from current and former owners / tenants as well as local people who may have a connection with the building. The setting of the listed building makes a reasonable contribution to its significance.

5.96 Although there are several hedgerows between the listed building and the application site, it is likely that there would be views of the proposed development from the upper floor of the building. Views towards the proposed development already include the large industrial buildings at the Business Park adjacent to Exeter International Airport, as well as recent large developments such as the Flybe Training Academy and the Hampton by Hilton hotel. However these structures are at least 2km from the listed building whereas the application site is 1.3km. Even with the planted landscape bunds which are part of the proposed development in place, the larger elements of the converter station would remain visible in views from the listed building.

5.97 There would be a very slight loss of significance with regard to this Grade II listed building as a result of change within its wider setting.
No effects are predicted on the nearby Grade II listed Ford Farmhouse (Site 012) or the Grade II listed Old Rectory (Site 013). In each case this is due to the presence of intervening mature vegetation, resulting in there being no intervisibility between the listed structures and the application site.

**Treasbeare Farmhouse (Site 014)**

The Grade II listed Treasbeare Farmhouse is located approximately 920m north-west of the application site and on the other side of the main airport runway. The immediate setting of the listed building comprises the farm buildings to the east and north-east, which include several large modern structures. The farmhouse is in an elevated location and its wider setting includes views to and from the listed building from several directions, principally the south and west.

The significance of the listed building is derived from all of the key values identified in *Conservation Principles*; evidential, historical, aesthetic and communal. The evidential and historic values are linked to the information derived from the study of the built fabric of the structure and of associated documents. There are aesthetic values associated with the visual appreciation of the historic structure and its setting. Communal values derive from current and former owners / tenants as well as local people who may have a connection with the building. The setting of the listed building makes a reasonable contribution to its significance.

Although there are several hedgerows between the listed building and the application site, it is likely that there would be views of the proposed development from the upper floor of the building. Views towards the proposed development already include the end of the main airport runway, whilst the view would also take in the large industrial buildings at the Business Park adjacent to Exeter International Airport, as well as recent large developments such as the Flybe Training Academy and the Hampton by Hilton hotel.

There would be a very slight loss of significance with regard to this Grade II listed building as a result of change within its wider setting.

**Farringdon House (Site 015)**

The Grade II listed Farringdon House is located approximately 1.4km to the south of the application site. The immediate setting of the listed building comprises the formal grounds to the east and north-east. A wider setting includes the former parkland associated with the house, which mostly extends to the south away from the principal facade. However there has been modern residential development along the former main access drive to the north and west of the house, whilst some historic buildings just west of the house and formerly associated with it have been separated and converted to residential use.

The significance of the listed building is derived from all of the key values identified in *Conservation Principles*; evidential, historical, aesthetic and communal. The evidential and historic values are linked to the information derived from the study of the built fabric of the structure and of associated documents. There are aesthetic values associated with the visual appreciation of the historic structure and its setting. Communal values derive from current and former owners / tenants as well as local people who may have a connection with the building. The setting of the listed building makes a reasonable contribution to its significance.
5.105 It is unlikely that there would be views of the proposed development from any part of the building, largely as a result of screening vegetation and the adjacent residential development. There would be no loss of significance with regard to this Grade II listed building.

5.106 Similarly there would be no loss of significance with regard to the Grade II listed gate posts at the end of the drive formerly leading to Farringdon House (Site 016).

Killerton House Registerd Park and Garden (Site 017)

5.107 The Grade II* Registered Historic Park and Garden at Killerton House is located approximately 7.3km north-west of the application site. The park extends for more than 100 hectares and is surrounded by farmland with a mixture of arable and pasture. The M5 motorway is just to the east of the park.

5.108 The significance of the Registered Historic Park and Garden is derived from all of the key values identified in *Conservation Principles*; evidential, historical, aesthetic and communal. The evidential and historic values are linked to the information derived from the study of the physical nature of the park and of associated documents which link the development of the park and garden with the principal house. There are aesthetic values associated with the visual appreciation of the park and its setting. Communal values derive from current and former owners of the principal house and also the staff, as well as local people who may have a connection with the house and its grounds and also visitors, as this is a National Trust property. The wider setting of the Registered Historic Park and Garden makes a slight contribution to its significance.

5.109 It is possible that there would be views towards the proposed development from open areas within the Registered Historic Park and Garden. However such views would be across the M5 motorway and would include Exeter International Airport and the associated large industrial buildings at the Business Park as well as recent large developments such as the Flybe Training Academy and the Hampton by Hilton hotel. At a minimum distance of 7.3km it would be difficult to discern the proposed development as a separate entity.

5.110 There would be no loss of significance with regard to this Grade II* Registered Historic Park and Garden as a result of change within its wider setting.

5.111 Similarly there would be no loss of significance with regard to the Grade II* listed Killerton House (Site 018), the Grade I listed Chapel of the Holy Evangelists (Site 019), the Grade II* listed Bear’s Hut (Site 020) or the two Scheduled Monuments within the park at Killerton (Sites 021 and 022).

Broadclyst Conservation Area (Site 023)

5.112 The Conservation Area at Broadclyst is located approximately 4.4km north-west of the application site. Examination of the Zone of Theoretical Visibility (ZTV) established for the landscape and visual appraisal of the proposed development (Figure 4.5) indicates that the converter station would not be visible from the Conservation Area. Therefore there would be no change to the significance of the Conservation Area.
5.113 Similarly there would be no change to the significance of the Grade I listed Church of St John the Baptist (Site 024), the Grade II listed Red Lion Inn (Site 025) or the two Scheduled Monuments at Broadclyst (Sites 026 and 027).

Historic Landscape

5.114 Although the Devon Historic Landscape Characterisation (HLC) mapping indicates that the historic landscape of the application site and adjacent land comprises ‘Barton fields’, examination of historic mapping as described above suggests that the field boundary layout was amended in the early part of the 19th century. A more likely category for the HLC at this location would be ‘Modern enclosures’. This category is relatively common across this part of East Devon (cf. Figure 5.7) and no significant effects on the character of the overall historic landscape are predicted to occur as a result of this proposed development.

Cumulative Impacts

5.115 Examination has been undertaken with regard to other potential development schemes that could result in significant cumulative effects on any aspect of the historic environment. The developments identified for consideration are identified on Figure 2.9 and Appendix 2.2. No significant cumulative effects on any aspect of the historic environment have been identified.

Proposed Mitigation Measures

5.116 It is proposed that a programme of archaeological evaluation would be undertaken with regard to one of the linear anomalies recorded by the geophysical survey. This anomaly is on a different alignment to the existing and former field boundaries and may therefore have a different origin. The initial phase of the archaeological evaluation will be in the form of trial trenches placed to intercept the linear anomaly. Further, more detailed, investigation may be required depending on the results of the trial trenching.

5.117 The archaeological evaluation would be required through an appropriately worded condition placed on the planning consent. It would be undertaken ahead of the commencement of construction and would be in line with a written scheme of investigation that would be agreed in advance with the archaeological advisor to the planning authority.

5.118 No further mitigation is proposed with regard to any effects on heritage assets resulting from changes within their settings.

Future Monitoring

5.119 No future monitoring is proposed with regard to any aspect of archaeology and cultural heritage.

Summary

5.120 The assessment has found that the proposed development would result in a slight loss of significance with regard to one Grade I and three Grade II listed buildings and also one Grade II Registered Historic Park and Garden. There would also be a very slight loss of significance with regard to two Grade II listed buildings. In each case this is the result of change within the settings of these heritage assets.
5.121 Some mitigation with regard to visual impacts has been designed into the proposed development. This is in the form of earth bunds around the perimeter of the converter station, topped with vegetation. No further mitigation is proposed in respect of changes within the settings of heritage assets.

5.122 The assessment has found that the proposed development would not have any significant effect on the character of the overall historic landscape in the vicinity of the application site.

5.123 No significant effects are predicated with regard to buried archaeological remains. A programme of desk-based study and geophysical survey has identified that the application site contains remains associated with the use of the airfield in WWII, also features associated with agricultural activity such as former field boundaries and extraction pits subsequently used as ponds.

5.124 Mitigation for any impacts on buried archaeological remains would be in the form of archaeological investigation. Initially this would be in the form of trial trenches targeting a linear anomaly identified by geophysical survey. Further, more detailed, investigation may be undertaken depending on the results of the trial trenching.

5.125 No significant cumulative effects on any aspect of the historic environment have been identified.
References


6 Air Quality and Health

Introduction

6.1 This chapter appraises the likelihood of air quality impacts from the proposed FAB Link HVDC converter station development near Exeter Airport. This chapter draws on relevant guidance and consultation to inform the appraisal and sets out the proposed measures to mitigate any potential adverse impacts.

6.2 On the basis of the guidance for Electric and Magnetic Fields (EMFs) from electricity infrastructure adopted in the UK and the published supporting evidence, the levels of EMFs from the proposed development would be well below the guideline public exposure reference levels set to protect health and have therefore not required addressing in the Environmental Report for the Converter Station.

6.3 During the construction phase of the proposed converter station, dusts and particulates, and vehicle emissions could potentially impact local air quality. The potential impact to air quality from dusts and particulates has been assessed qualitatively, using the Institute of Air Quality Management (IAQM) method ‘Guidance on the assessment of dust from demolition and construction’ (2014). This assessment method takes into consideration current air quality conditions informed by the results of available local monitoring and data available in Defra (Department for Environmental, Food and Rural Affairs) maps. An assessment of potential impacts to local air quality from construction traffic emissions has been scoped out on the basis that the number of trips generated falls below the indicative threshold for assessment in Environmental Protection UK/IAQM guidance document ‘Land-Use Planning & Development Control: Planning for Air Quality’ (2015).

6.4 During the operational phase, activities are not expected to generate dusts and particulates, although vehicle trips (e.g. for routine maintenance) could potentially impact local air quality. An assessment of potential impacts to local air quality from operational traffic emissions has been scoped out on the basis that the number of trips generated falls below the indicative threshold for assessment in Environmental Protection UK/IAQM guidance (EPUK/IAQM, 2015).

Assessment Methodology

Policy and Guidance

6.5 Relevant planning policy, legislation and guidance relating to air quality is contained within:

- National Planning Policy Framework (NPPF) (DCLG, 2012). The NPPF sets out 12 core land-use planning principles. The relevant core-principle in the context of air quality is that planning should “contribute to conserving and enhancing the natural environment and reducing pollution.” (Paragraph 17).

- National Planning Practice Guidance (NPPG) (DCLG, 2014) advises that whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. The NPPG states that when deciding whether air quality is relevant to a planning
application, considerations could include whether the development would: “....Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations.”

• Institute of Air Quality Management (IAQM) ‘Guidance on the assessment of dust from demolition and construction’ (IAQM, 2014) aims to estimate the impacts of both PM$_{10}$ and dust through a risk-based assessment procedure, and define the appropriate site-specific mitigation measures. The guidance states that provided the mitigation measures are successfully implemented, the resultant effects of the dust exposure will normally be "not significant".


Consultation

6.6 A summary of consultation with the local planning authority, East Devon District Council (EDDC), is provided in the table below.

Table 6.1: Consultation Responses Relevant to this Chapter

<table>
<thead>
<tr>
<th>Date</th>
<th>Consultee and Issues Raised</th>
<th>How/ Where Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 June 2016</td>
<td>John Smith - East Devon District Council. Consulted with the council to agree the scope of works for assessment. The council was in agreement with the following scope of proposed work:</td>
<td>The assessment has been undertaken in accordance with the agreed scope of works.</td>
</tr>
<tr>
<td></td>
<td>• The focus of the Air Quality Assessment Chapter is the potential impacts to air quality from dust and particulates generated during the construction phase of the proposed converter substation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The potential impact to air quality from dusts and particulates generated during the construction phase for the proposed converter substation will be assessed qualitatively, using the Institute of Air Quality Management (IAQM) method ‘Guidance on the assessment of dust from demolition and construction’ (2014).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sufficient information is expected to be available to allow a desktop assessment of the impacts; no site survey work is necessary</td>
<td></td>
</tr>
</tbody>
</table>
### Consultee and Issues Raised

<table>
<thead>
<tr>
<th>Date</th>
<th>Consultee and Issues Raised</th>
<th>How/ Where Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>or is proposed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• It is proposed to scope out an assessment of emissions from traffic on the basis that the number of trips to be generated is below the relevant indicative threshold for assessment in the following guidance: Environmental Protection UK/Institute of Air Quality Management (EPUK/IAQM) (2015) Land-Use Planning &amp; Development Control: Planning for Air Quality.</td>
<td></td>
</tr>
</tbody>
</table>

### Methodology

#### Overview

6.7 The focus of this chapter is the potential impacts on air quality from dust and particulates generated during the construction phase of the proposed converter station as part of the FAB Link Interconnector project. The potential impact to air quality from dusts and particulates generated during the construction phase of the proposed converter station has been assessed qualitatively, using the Institute of Air Quality Management (IAQM) method ‘Guidance on the assessment of dust from demolition and construction’ (IAQM, 2014). This assessment method takes into consideration current air quality conditions informed by the results of available local monitoring and data available in Defra maps (Defra, 2016).

6.8 During the construction and operational phases, vehicle trips could potentially impact local air quality. However, an assessment of potential impacts to local air quality from traffic emissions has been scoped out on the basis that the number of trips generated falls below the indicative threshold for assessment in Environmental Protection UK/IAQM guidance document ‘Land-Use Planning & Development Control: Planning for Air Quality’ (2015) (summarised below).

*Indicative criteria for requiring an air quality assessment

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1. **Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors.** (LDV = cars and small vans <3.5t gross vehicle weight)

   A change of LDV flows of:

   -- more than 100 AADT\(^1\) within or adjacent to an AQMA

   -- more than 500 AADT elsewhere

---

\(^1\) Annual average daily traffic.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight)

A change of HDV flows of

-- more than 25 AADT within or adjacent to an AQMA

-- more than 100 AADT elsewhere”.

Method - Construction Dust Assessment

6.9 The effects of dust are linked to particle size and two main categories are usually considered:

- Particulate matter, with a mean aerodynamic diameter up to 10 µm (PM$_{10}$), remain suspended in the air for long periods and are small enough to be breathed in and so can potentially impact on health; and

- Dust, generally considered to be particles larger than 10 µm which fall out of the air quite quickly and can soil surfaces (e.g. a car, window sill, laundry). Additionally, accumulation of dust can potentially have adverse effects on vegetation and fauna at sensitive habitat sites.

6.10 The IAQM Guidance on the assessment of dust from demolition and construction sets out 350 m as the distance from the site boundary and 50 m from the site traffic route(s) up to 500 m of the entrance, within which there could potentially be dust and PM$_{10}$ effects on human receptors (IAQM, 2014). For sensitive ecological receptors, the corresponding distances are 50 m in both cases. (In this particular application, there are no ecological designations and therefore no sensitive ecological receptors within the distances and ecological effects have been scoped out). These distances are set to be deliberately conservative.

6.11 The IAQM dust guidance aims to estimate the impacts of both PM$_{10}$ and dust through a risk-based assessment procedure, using the well-established source-pathway-receptor approach. The dust risk categories that have been determined for each of the four activities (demolition, earthworks, construction and trackout) have been used to define the appropriate site-specific mitigation measures based on those described in the IAQM dust guidance. The guidance states that provided the mitigation measures are successfully implemented, the resultant effects of the dust exposure will normally be “not significant”.

6.12 This assessment does not consider the air quality impacts of dust from any contaminated land or buildings. The potential for contaminated land is assessed in Chapter 9.

Source

6.13 The IAQM dust guidance gives examples of the dust emission magnitudes for demolition, earthworks and construction activities and trackout. These example magnitudes have been combined with details of the period of construction activities to provide the ranking for the source magnitude that is set out in Table 6.2.
### Table 6.2: Risk Allocation – Source (Dust Emission Magnitude)

<table>
<thead>
<tr>
<th>Features of the Source of Dust Emissions</th>
<th>Dust Emission Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demolition</strong> - building over 50,000 m³, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities &gt; 20 m above ground level.</td>
<td>Large</td>
</tr>
<tr>
<td><strong>Earthworks</strong> – total site area over 10,000 m², potentially dusty soil type (e.g. clay), &gt;10 heavy earth moving vehicles active at any one time, formation of bunds &gt; 8 m in height, total material moved &gt; 100,000 tonnes.</td>
<td></td>
</tr>
<tr>
<td><strong>Construction</strong> - total building volume over 100,000 m³, activities include piling, on-site concrete batching, sand blasting. Period of activities more than two years.</td>
<td></td>
</tr>
<tr>
<td><strong>Trackout</strong> – 50 HDV outwards movements in any one day, potentially dusty surface material (e.g. High clay content), unpaved road length &gt; 100 m.</td>
<td></td>
</tr>
<tr>
<td><strong>Demolition</strong> - building between 20,000 to 50,000 m³, potentially dusty construction material and demolition activities 10 - 20 m above ground level.</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Earthworks</strong> – total site area between 2,500 to 10,000 m², moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 - 8 m in height, total material moved 20,000 to 100,000 tonnes.</td>
<td></td>
</tr>
<tr>
<td><strong>Construction</strong> - total building volume between 25,000 and 100,000 m³, use of construction materials with high potential for dust release (e.g. concrete), activities include piling, on-site concrete batching. Period of construction activities between one and two years.</td>
<td></td>
</tr>
<tr>
<td><strong>Trackout</strong> – 10 - 50 HDV outwards movements in any one day, moderately dusty surface material (e.g. High clay content), unpaved road length 50 – 100 m.</td>
<td></td>
</tr>
<tr>
<td><strong>Demolition</strong> - building less than 20,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities &lt; 10 m above ground, demolition during winter months.</td>
<td>Small</td>
</tr>
<tr>
<td><strong>Earthworks</strong> – total site area less than 2,500 m². Soil type with large grain size (e.g. sand), &lt; 5 heavy earth moving vehicles active at any one time, formation of bunds &lt; 4 m in height, total material moved &lt; 10,000 tonnes earthworks during winter months.</td>
<td></td>
</tr>
<tr>
<td><strong>Construction</strong> - total building volume below 25,000 m³, use of construction materials with low potential for dust release (e.g. metal cladding or timber). Period of construction activities less than one year.</td>
<td></td>
</tr>
<tr>
<td><strong>Trackout</strong> – &lt; 10 HDV outwards movements in any one day, surface material with low potential for dust release, unpaved road length &lt; 50 m.</td>
<td></td>
</tr>
</tbody>
</table>

### Pathway and Receptor - Sensitivity of the Area

6.14 Table 6.3 and Table 6.4 sets out the IAQM basis for categorising the sensitivity of people and property to dust and PM_{10} respectively.
Table 6.3: Sensitivities of People and Property Receptors to Dust

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles:-</td>
<td>High</td>
</tr>
<tr>
<td>▪ Users can reasonably expect enjoyment of a high level of amenity; or</td>
<td></td>
</tr>
<tr>
<td>▪ the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods as part of the normal pattern of use of the land.</td>
<td></td>
</tr>
<tr>
<td>Indicative Examples:-</td>
<td></td>
</tr>
<tr>
<td>▪ Dwellings.</td>
<td></td>
</tr>
<tr>
<td>▪ Museums and other culturally important collections.</td>
<td></td>
</tr>
<tr>
<td>▪ Medium and long-term car parks and car showrooms.</td>
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</tr>
<tr>
<td>Principles:-</td>
<td>Medium</td>
</tr>
<tr>
<td>▪ Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or</td>
<td></td>
</tr>
<tr>
<td>▪ the appearance, aesthetics or value of their property could be diminished by soiling; or</td>
<td></td>
</tr>
<tr>
<td>▪ the people or property wouldn’t reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.</td>
<td></td>
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<tr>
<td>Indicative Examples:-</td>
<td></td>
</tr>
<tr>
<td>▪ Parks.</td>
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</tr>
<tr>
<td>▪ Places of work.</td>
<td></td>
</tr>
<tr>
<td>Principles:-</td>
<td>Low</td>
</tr>
<tr>
<td>▪ the enjoyment of amenity would not reasonably be expected; or</td>
<td></td>
</tr>
<tr>
<td>▪ there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or</td>
<td></td>
</tr>
<tr>
<td>▪ there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.</td>
<td></td>
</tr>
<tr>
<td>Indicative Examples:-</td>
<td></td>
</tr>
<tr>
<td>▪ Playing fields, farmland (unless commercially-sensitive horticultural).</td>
<td></td>
</tr>
<tr>
<td>▪ Footpaths and roads.</td>
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</tr>
<tr>
<td>▪ Short-term car parks.</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.4: Sensitivities of People and Property Receptors to PM$_{10}$

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles:-</td>
<td>High</td>
</tr>
<tr>
<td>▪ Locations where members of the public are exposed over a time period relevant to the air quality objective (in the case of the 24-hour objective for PM$_{10}$, a relevant location would be one where individuals may be exposed for eight hours or more in a day).</td>
<td></td>
</tr>
</tbody>
</table>
Indicative Examples:
- Residential properties.
- Schools, hospitals and residential care homes.

Principles:
- Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective (in the case of the 24-hour objective for PM$_{10}$, a relevant location would be one where individuals may be exposed for eight hours or more in a day).

Indicative Examples:
- Office and shop workers (but generally excludes workers occupationally exposed to PM$_{10}$ as protection is covered by Health and Safety at Work legislation).

**Medium**
- Locations where human exposure is transient exposure.

Indicative Examples:
- Public footpaths.
- Playing fields, parks.
- Shopping streets.

6.15 The IAQM methodology combines consideration of the pathway and receptor to derive the ‘sensitivity of the area’. Table 6.5 and Table 6.6 show how the sensitivity of the area has been derived for this assessment.

**Table 6.5: Sensitivity of the Area to Dust Soiling Effects on People and Property**

<table>
<thead>
<tr>
<th>Receptor Sensitivity</th>
<th>Number of Receptors a</th>
<th>Distance from the Source (m) b</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt;20</td>
</tr>
<tr>
<td>High</td>
<td>&gt;100</td>
<td>High</td>
</tr>
<tr>
<td>10-100</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>1-10</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Medium</td>
<td>&gt;1</td>
<td>Medium</td>
</tr>
<tr>
<td>Low</td>
<td>&gt;1</td>
<td>Low</td>
</tr>
</tbody>
</table>

The sensitivity of the area has been derived for demolition, construction, earthworks and trackout.

a The total number of receptors within the stated distance has been estimated. Only the highest level of area sensitivity from the table has been recorded.

b For trackout, the distances have been measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site, and trackout impacts have only been considered up to 50 m from the edge of the road.
Table 6.6: Sensitivity of the Area to Human Health Impacts

<table>
<thead>
<tr>
<th>Receptor Sensitivity</th>
<th>Annual Mean PM10 Concentration b</th>
<th>Number of Receptors c</th>
<th>Distance from the Source (m) d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;20</td>
</tr>
<tr>
<td>High</td>
<td>&gt; 32 µg.m⁻³</td>
<td>&gt;100</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10-100</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-10</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>28 - 32 µg.m⁻³</td>
<td>&gt;100</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10-100</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-10</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>24 - 28 µg.m⁻³</td>
<td>&gt;100</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10-100</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-10</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>&lt; 24 µg.m⁻³</td>
<td>&gt;100</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10-100</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-10</td>
<td>Low</td>
</tr>
<tr>
<td>Medium</td>
<td>&gt; 32 µg.m⁻³</td>
<td>&gt;100</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10-100</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-10</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>28 - 32 µg.m⁻³</td>
<td>&gt;100</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10-100</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-10</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>24 - 28 µg.m⁻³</td>
<td>&gt;100</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10-100</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-10</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>&lt; 24 µg.m⁻³</td>
<td>&gt;100</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10-100</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-10</td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>-</td>
<td>&gt;1</td>
<td>Low</td>
</tr>
</tbody>
</table>

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout.

a Estimate the total within the stated distance (e.g. the total within 350 m and not the number between 200 and 350 m) noting that only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors < 20 m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total number of receptors < 50 m is 102. If the annual mean PM10 concentration is 29 µg.m⁻³, the sensitivity of the area would be high.

b Most straightforwardly taken from the national background maps, but should also take into account local sources. The values are based on 32 µg.m⁻³ being the annual mean concentration at which an exceedance of the 24-hour objective is likely in England, Wales and Northern Ireland. In Scotland there is an annual mean objective of 18 µg.m⁻³.

c In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate number of people likely to be present. In the case of residential dwellings, just include the number of properties.

d For trackout, the distances should be measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites.
200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

6.16 The IAQM dust guidance lists the following additional factors that can potentially affect the sensitivity of the area and, where necessary, professional judgement has been used to adjust the sensitivity allocated to a particular area:

- any history of dust generating activities in the area;
- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between the source and the receptors;
- any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which the works will take place;
- any conclusions drawn from local topography;
- duration of the potential impact, as a receptor may become more sensitive over time; and
- any known specific receptor sensitivities which are considered go beyond the classifications given in the table above.

6.17 The matrices in Table 6.7, Table 6.8, Table 6.9 and Table 6.10 have been used to assign the risk for each activity to determine the level of mitigation that should be applied. For those cases where the risk category is ‘negligible’, no mitigation measures are required beyond those mandated by legislation.

**Table 6.7: Risk of Dust Impacts – Demolition**

<table>
<thead>
<tr>
<th>Sensitivity of Area</th>
<th>Dust Emission Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large</td>
</tr>
<tr>
<td>High</td>
<td>High Risk</td>
</tr>
<tr>
<td>Medium</td>
<td>High Risk</td>
</tr>
<tr>
<td>Low</td>
<td>Medium Risk</td>
</tr>
</tbody>
</table>

**Table 6.8: Risk of Dust Impacts – Earthworks**

<table>
<thead>
<tr>
<th>Sensitivity of Area</th>
<th>Dust Emission Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large</td>
</tr>
<tr>
<td>High</td>
<td>High Risk</td>
</tr>
<tr>
<td>Medium</td>
<td>Medium Risk</td>
</tr>
</tbody>
</table>
Table 6.9: Risk of Dust Impacts – Construction

<table>
<thead>
<tr>
<th>Sensitivity of Area</th>
<th>Dust Emission Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large</td>
</tr>
<tr>
<td>Low</td>
<td>Low Risk</td>
</tr>
<tr>
<td>High</td>
<td>High Risk</td>
</tr>
<tr>
<td>Medium</td>
<td>Medium Risk</td>
</tr>
<tr>
<td>Low</td>
<td>Low Risk</td>
</tr>
</tbody>
</table>

Table 6.10: Risk of Dust Impacts – Trackout

<table>
<thead>
<tr>
<th>Sensitivity of Area</th>
<th>Dust Emission Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large</td>
</tr>
<tr>
<td>High</td>
<td>High Risk</td>
</tr>
<tr>
<td>Medium</td>
<td>Medium Risk</td>
</tr>
<tr>
<td>Low</td>
<td>Low Risk</td>
</tr>
</tbody>
</table>

Limitations of the Assessment

6.18 Monitoring data were not available to inform existing (baseline) levels of PM₁₀ in the vicinity of the proposed converter station, and Defra mapped background concentration estimates of the relevant 1 km² areas were used. This is a robust approach, as the proposed converter station is located in a rural area away from discrete localised sources of pollution.

6.19 The assessment has taken the conservative approach of assuming the site boundary is the extent of earthworks and construction activities and the converter station design parameters from the Project Description (Chapter 2) including the temporary compound area have been used to inform the potential building dimensions. This is a robust approach.

Assessment of Construction Impacts

Existing (Baseline) Air Quality

6.20 East Devon District Council has declared “Exeter A30 Exeter Road, A375 Exeter Road, A375 High Street, A35 Monkton Road and A35 Kings Road at 0 to 6.6 m from the road centreline” as an Air Quality Management Area (AQMA) due to high levels of nitrogen dioxide (NO₂) pollution from road traffic. This AQMA is 15 km away, and the site for the proposed converter station is not located within an AQMA. The closest AQMA to the proposed converter station is 6 km away.
in the neighbouring district of Exeter City Council and comprises “a network of major roads in Exeter”. This AQMA was also declared due to high levels of NO\textsubscript{2} pollution from road traffic.

6.21 Monitoring is undertaken at two locations within 15 km of the converter substation as part of the Automatic Urban and Rural Network (AURN) programme: Exeter Roadside and Honiton Urban Background. Both stations measure levels of the key traffic-related pollutant NO\textsubscript{2}; however, an assessment of traffic emissions impacts has been scoped out (on the basis that the number of trips generated falls below the indicative threshold for assessment). So the local NO\textsubscript{2} monitoring is not relevant for this assessment.

6.22 In addition to local monitoring, Defra maps (Defra, 2016) are available to inform existing air quality conditions. Defra maps are concentration estimates for 1 km grid squares of the UK covering the years 2011 to 2030. The Defra mapped background concentration estimate for PM\textsubscript{10} for 2011 has been provided here for the grid square of the proposed converter station (301500, 93500). To put this value into context, the minimum, maximum and average Defra mapped background concentration estimates for grid squares within the East Devon District have also been provided.

Table 6.11: 2011 Defra Mapped Background Concentration (µg.m\textsuperscript{-3}) Estimate for PM\textsubscript{10}

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Location</th>
<th>Estimated Defra Mapped (2011) (µg.m\textsuperscript{-3})</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM\textsubscript{10}</td>
<td>Grid square of the proposed converter station (301500, 93500)</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>East Devon District (min)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>East Devon District (max)</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>East Devon District (average)</td>
<td>14</td>
</tr>
</tbody>
</table>

6.23 The Defra mapped background concentration estimate for the grid square of the proposed converter station (301500, 93500) is in the middle of the range of Defra estimates for grid squares within the East Devon District.

6.24 In the absence of local monitoring for PM\textsubscript{10}, the Defra mapped background concentration estimate for PM\textsubscript{10} for 2011 has been used to inform existing air quality for the assessment.

**Risk of Dust Impacts**

6.25 The level and distribution of construction dust emissions will vary according to factors such as the type of dust, duration and location of dust-generating activity, weather conditions and the effectiveness of suppression methods.

6.26 The main effect of any dust emissions, if not mitigated, could be annoyance due to soiling of surfaces, particularly windows, cars and laundry. However, it is normally possible, by implementation of proper control, to ensure that dust deposition does not give rise to significant adverse effects, although short-term events may occur (for example, due to technical failure or exceptional weather conditions). The following assessment, using the IAQM methodology,
predicts the risk of dust impacts and the level of mitigation that is required to control the residual effects to a level that is “not significant”.

Source

6.27 The site is currently undeveloped and demolition of existing structures will not be required. Demolition has not been considered further in this assessment.

6.28 The combined area for the converter station and lay-down area is in excess of 10,000 m², and a maximum of 40,000 m³ of soil will be moved during the cut and fill operation. The dust emission magnitude for the earthworks phase has been classified as large.

6.29 The total volume of the buildings to be constructed would be in excess of 100,000 m³ and the dust emission magnitude for the construction phase is classified as large.

6.30 It is expected that site mobilisation, demobilisation, ground works and civil engineering works will generate an average of 40 two-way HDV movements per day, and a maximum of 85 two-way HDV movements per day. The maximum number of outward movements in any one day is more than 50 HDVs, the dust emission magnitude for trackout would be classified as large.

Table 6.12: Dust Emission Magnitude for Earthworks, Construction and Trackout

<table>
<thead>
<tr>
<th>Demolition</th>
<th>Earthworks</th>
<th>Construction</th>
<th>Trackout</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Large</td>
<td>Large</td>
<td>Large</td>
</tr>
</tbody>
</table>

Pathway and Receptor - Sensitivity of the Area

6.31 All demolition, earthworks and construction activities are assumed to occur within the site boundary. As such, receptors at distances within 20 m, 50 m, 100 m, 200 m and 350 m of the study area have been identified and are illustrated in Figure 6.1. The sensitivity of the area has been classified as shown in Table 6.13 below.

Table 6.13: Sensitivity of the Surrounding Area for Earthworks and Construction

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Sensitivity of the Surrounding Area</th>
<th>Reason for Sensitivity Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust Soiling</td>
<td>Medium</td>
<td>Adjacent to the lay-off area is a small number (&lt;10) of high sensitivity (residential) receptors; and medium sensitivity receptors (places of work) including: antiques outlet, airport parking, exhibition stand/graphic design company, printing business and Environment Agency Clyst Honiton Depot. &lt;10 high sensitivity and &gt;1 medium sensitivity receptors located within 20 m of the site boundary (Table 6.6).</td>
</tr>
<tr>
<td>Human Health (PM$_{10}$)</td>
<td>Low</td>
<td>The Defra mapped concentration estimate for PM$_{10}$ for the grid square of the proposed converter station (301500, 93500) = 15 µg.m$^{-3}$.</td>
</tr>
</tbody>
</table>
6.32 The Dust Emission Magnitude for trackout is classified as large and trackout may occur on roads up to 500 m from the site. The major route within 500 m of the site is Long Lane. The sensitivity of the area has been classified as shown in Table 6.14 below.

Table 6.14: Sensitivity of the Surrounding Area for Trackout

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Sensitivity of the Surrounding Area</th>
<th>Reason for Sensitivity Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust Soiling</td>
<td>Medium</td>
<td>Off the Long Lane there is a small number (&lt;10) of high sensitivity (residential) receptors; and a small industrial estate, which comprises medium sensitivity receptors (places of work) including: antiques outlet, airport parking, exhibition stand/graphic design company, printing business and Environment Agency Clyst Honiton Depot. &lt;10 high sensitivity and &gt;1 medium sensitivity aligning Long Lane (Table 6.6).</td>
</tr>
<tr>
<td>Human Health (PM$_{10}$)</td>
<td>Low</td>
<td>The Defra mapped concentration estimate for PM$<em>{10}$ for the grid square of the proposed converter station (301500, 935000) = 15 µg.m$^{-3}$. &lt;10 high sensitivity and between 1 and 10 medium sensitivity receptors aligning Long Lane and PM$</em>{10}$ concentrations below 24 µg.m$^{-3}$ (Table 6.7).</td>
</tr>
</tbody>
</table>

Overall Dust Risk

6.33 The Dust Emission Magnitude has been considered in the context of the Sensitivity of the Area to give the Dust Impact Risk. Table 6.15 summarises the Dust Impact Risk for the four activities.

Table 6.15: Dust Impact Risk for Earthworks, Construction and Trackout

<table>
<thead>
<tr>
<th>Source</th>
<th>Earthworks</th>
<th>Construction</th>
<th>Trackout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust Soiling</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Human Health (PM$_{10}$)</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Risk</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>
6.34 Taking the site as a whole, the overall risk is deemed to be medium which is derived from the medium risk of off-site dust soiling rather than a risk to Human Health (PM$_{10}$) which is assessed as low risk. The mitigation measures appropriate to a level of risk for the site as a whole and for each of the phases are set out in the ‘Proposed Mitigation Measures’ section of this chapter.

6.35 Provided this package of mitigation measures is implemented, the residual construction dust effects will not be significant. The IAQM dust guidance states that “For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be ‘not significant’.” The IAQM dust guidance recommends that significance is only assigned to the effect after the activities are considered with mitigation in place.

Assessment of Operational Impacts

6.36 During the operational phase, vehicle trips (e.g. for routine maintenance) could potentially impact local air quality; however, an assessment of traffic emissions impacts has been scoped out on the basis that the number of trips generated falls below the indicative threshold for assessment in Environmental Protection UK/IAQM guidance document ‘Land-Use Planning & Development Control: Planning for Air Quality’ (2015), as summarised in paragraph 6.8.

Cumulative Impacts

6.37 The developments shown on Figure 2.9 and listed in Appendix 2.2 have been considered in the cumulative assessment. The assessment of potential cumulative impacts has been limited to the construction phase. The study area for cumulative assessment for air quality is 700 m from the proposed development. At a distance greater than 350 m from construction activities, the IAQM guidance advises that impacts are expected to be ‘negligible’. Developments within 700 m (i.e. 350 m from each development) of the proposed converter station could be expected to have a cumulative impact with regard to air quality if construction activities at other development sites take place during the same period.

6.38 The proposed industrial unit, roadways, parking and infrastructure (ref. 16/1578/MFUL) to the west of the converter station, is within 350 m of the site boundary of the proposed converter station. Therefore there could potentially be a cumulative dust effect at nearby receptors if construction of the two developments were to occur simultaneously. Providing that the appropriate mitigation measures, such as those recommended by the IAQM (see below), are implemented for both developments, then the cumulative effects should be ‘not significant’.

Proposed Mitigation Measures

6.39 IAQM dust guidance lists mitigation measures for low, medium and high dust risks.

6.40 As summarised in Table 6.15, the predicted Dust Impact Risk is classified as medium for Earthworks and Construction, and Trackout. Taking the site as a whole, the overall risk is deemed to be medium. The general site measures described as ‘highly recommended’ for medium risk sites by the IAQM are listed below in Table 6.16. The ‘highly recommended’ measures for medium risk construction sites and trackout are also listed. There are no ‘highly recommended’ measures for medium risk earthworks.
### Table 6.16: Proposed Mitigation Measures

<table>
<thead>
<tr>
<th>Communications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Display the name and contact details of person(s) accountable for air quality</td>
</tr>
<tr>
<td>and dust issues on the site boundary. This may be the environment manager/</td>
</tr>
<tr>
<td>engineer or the site manager.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Record all dust and air quality complaints, identify cause(s), take</td>
</tr>
<tr>
<td>appropriate measures to reduce emissions in a timely manner, and record the</td>
</tr>
<tr>
<td>measures taken.</td>
</tr>
<tr>
<td>• Make the complaints log available to the local authority when asked.</td>
</tr>
<tr>
<td>• Record any exceptional incidents that cause dust and/or air emissions,</td>
</tr>
<tr>
<td>either on- or off-site, and the action taken to resolve the situation in the</td>
</tr>
<tr>
<td>log book.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preparing and maintaining the site</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Plan site layout so that machinery and dust causing activities are located</td>
</tr>
<tr>
<td>away from receptors, as far as is possible. Use screening intelligently where</td>
</tr>
<tr>
<td>possible — e.g. locating site offices between potentially dusty activities and</td>
</tr>
<tr>
<td>the receptors.</td>
</tr>
<tr>
<td>• Erect solid screens or barriers around the site boundary.</td>
</tr>
<tr>
<td>• Avoid site runoff of water or mud.</td>
</tr>
<tr>
<td>• Keep site fencing, barriers and scaffolding clean.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ensure an adequate water supply on the site for effective dust/particulate</td>
</tr>
<tr>
<td>matter suppression/mitigation, using non-potable water where possible.</td>
</tr>
<tr>
<td>• Use enclosed chutes, conveyors and covered skips, where practicable.</td>
</tr>
<tr>
<td>• Minimise drop heights from conveyors, loading shovels, hoppers and other</td>
</tr>
<tr>
<td>loading or handling equipment and use fine water sprays on such equipment</td>
</tr>
<tr>
<td>wherever appropriate.</td>
</tr>
<tr>
<td>• Ensure equipment is readily available on site to clean any dry spillages,</td>
</tr>
<tr>
<td>and clean up spillages as soon as reasonably practicable after the event</td>
</tr>
<tr>
<td>using wet cleaning methods.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waste management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Avoid bonfires and burning of waste materials.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medium risk measures specific to construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ensure sand and other aggregates are stored in bunded areas and are not</td>
</tr>
<tr>
<td>allowed to dry out, unless this is required for a particular process, in</td>
</tr>
<tr>
<td>which case ensure that appropriate additional control measures are in place.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medium risk measures specific to trackout</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Use water-assisted dust sweeper(s) on the access and local roads, to</td>
</tr>
<tr>
<td>remove, as soon as practicable any material tracked out of the site. This</td>
</tr>
<tr>
<td>may require the sweeper being</td>
</tr>
</tbody>
</table>
continuously in use.

- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as practicable;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site).

Future Monitoring

6.41 Further IAQM guidance (IAQM, 2012) states that the following dust monitoring is required for medium-risk sites to show that the controls are working:

“Monitoring dustfall (as mass deposition rate and/or soiling rate) at nearby receptors is also required, together with monitoring of dust flux across the site boundary (if there is a need to distinguish the contributions of the site from other sites or the general background).”

Summary

6.42 This assessment has considered the potential impact on local air quality from dust and particulates generated during the construction phase

6.43 The results of the risk assessment of construction dust impacts undertaken using the IAQM dust guidance, indicates that before the implementation of mitigation and controls, the risk of dust impacts will be medium. The IAQM dust guidance lists mitigation measures for low, medium and high dust risks and it is proposed to implement the highly-recommended mitigation measures appropriate to the level of risk at the site. Implementation of the highly-recommended mitigation measures described in the IAQM construction dust guidance should reduce the residual dust effects to a level categorised as “not significant”.
References


Departments for Communities and Local Government (DCLG) (2014) National Planning Practice Guidance


7 Noise and Vibration

Introduction

7.1 This chapter appraises the likelihood of noise and vibration impacts from the proposed FAB Link HVDC converter station development near Exeter Airport. This chapter draws on relevant topic guidance and consultation to inform the appraisal and sets out the proposed measures to mitigate any potential adverse impacts.

7.2 This chapter contains the approach to the assessment; a description of the baseline noise environment; identification of those aspects of the proposed development that may cause noise and/or vibration impacts; predictions of noise propagation to the nearest Noise Sensitive Receptors (NSRs) and assessments potential noise and/or vibration impacts. Mitigation measures are identified where necessary to reduce impacts. The spatial scope of the assessment is focused on the nearest NSRs to the proposed converter station.

Acoustic Terminology and Concepts

7.3 This section provides an overview of the fundamentals of how sound propagates away from a source.

7.4 Increasing the distance from a noise source normally results in the level of noise getting quieter, due primarily to the spreading of the sound with distance, analogous to the way in which the ripples in a pond spread after a stone has been thrown in. Another important factor relates to the type of ground over which the sound is travelling. Acoustically “soft” ground, (such as grassland, ploughed fields etc.) will result in lower levels of noise with increasing distance from the noise source as compared to acoustically “hard” surfaces (e.g. concrete, water, paved areas). The reduction in noise level depends, however, on the frequency of the sound.

7.5 Wind also affects the way in which sound propagates, with noise levels downwind of a source being louder than upwind. This is partly due to the sound ‘rays’ being bent either upwards or downwards by the wind in a similar way that light is bent by a lens, as shown in Inset 8.1 below. Varying temperatures in the atmosphere can also cause sound ‘rays’ to be bent, adding to the complexity of sound propagation.
Inset 8.1  Refraction of Sound Waves Due to Wind Gradients (Increasing Wind Speed with Height)

7.6  Another attenuation mechanism is absorption of sound by the molecules of the atmosphere. Higher pitched (higher frequency) sounds are more readily absorbed than lower pitched (lower frequency) sounds. The factors affecting the extent to which the sound is absorbed are the temperature and the water content of the atmosphere (relative humidity).

7.7  The effect of varying temperature and humidity is usually minimal when compared to other factors, such as wind and ground effects. However, where high frequency sounds are encountered, there may well be a significant variation between measured sound levels on different days due to variations in temperature and humidity.

7.8  When hearing noise which occurs out in the open (e.g. from road traffic, aircraft, birds, wind in the trees etc.), it is common experience that the noise level is not constant in loudness but is changing in amplitude all of the time. Therefore, in order to numerically describe the noise levels, it is beneficial to use statistical parameters. It has become practice to use indices which describe the noise level which has been exceeded for a certain percentage of the measurement period, and also an index which gives a form of average of the sound energy over a particular time interval. The former are termed percentile noise levels and are notated $L_{A90}$, $L_{A50}$, $L_{A10}$ etc. and the latter is termed the equivalent continuous noise level and is notated by $L_{Aeq}$. It is worth noting that if the noise level does not vary with time, then all the parameters, in theory, normalise to a single value.

7.9  With regard to the percentile levels, the $L_{A90}$ is the sound pressure level which is exceeded for 90% of the measurement time. It is generally used as the measure of background noise (i.e. the underlying noise) in environmental noise standards.

7.10 The $L_{Aeq}$ (sometimes denoted $L_{Aeq,T}$) is the A-weighted equivalent continuous noise level and is an energy averaged value of the actual time varying sound pressure level over the time interval, $T$. It is used in the UK as a measure of the noise level of a specific industrial noise source when assessing the level of the specific source against the background noise. It is also used as a measure of ambient noise (i.e. the "all-encompassing" sound field).
7.11 Other useful parameters for describing noise include the maximum and minimum sound pressure level encountered over the time period, denote $L_{A_{\text{max}}}$ and $L_{A_{\text{min}}}$ respectively.

7.12 The term ‘A’ weighting implies a measurement made using a filter with a standardised frequency response which approximates the frequency response of the human ear at relatively low levels of noise. The resulting level, expressed in 'A' weighted decibels, or dBA, is widely used in noise standards, regulations and criteria throughout the world.

7.13 For a more detailed analysis of the frequency characteristics of a noise source, then noise measurements can be made in bands of frequencies, usually one octave wide. The resulting levels are termed octave band sound pressure levels. The standard octave band centre frequencies range from 31.5 Hz (about three octaves below middle ‘C’ on the piano) to 8 kHz (about five octaves above middle ‘C’). This covers most of the audible range of frequencies (usually taken to be around 20 Hz to 20 kHz). Octave band noise levels are usually quoted as linear data – i.e. without an ‘A’ weighting filter being applied. For more detailed analysis narrowband filters are useful for analysing tones.

7.14 The term decibel is a relative quantity and should always be referenced to an absolute level. In this report, all sound pressure levels (denoted $L_P$) are expressed in dB re 20 µPa. Hence, a sound pressure level of 0 dBA refers to a pressure level of 20 µPa, which is generally taken as the lowest level of sound that the human ear can detect. A negative dBA value usually implies that the sound is below the threshold of human hearing.

7.15 Subjectively, and for steady noise levels, a change in noise level of 3 dB is normally just discernible to the human ear. However, a noise change of less than 3 dB could be discernible if it has particular frequency characteristics or if it varies in loudness over time. A difference of 10 dB represents a doubling or halving of subjective loudness.

7.16 Sound power (denoted $L_W$) is the acoustical power radiated from a sound source. The advantage of using the sound power level, rather than the sound pressure level, in reporting noise from a source is that the sound power is independent of the location of the source, distance from the measurement point and environmental conditions. If the sound power of a source is known, then it is possible to calculate the sound pressure level at a distance away from the source, accounting for the attenuation due to propagation, as discussed above. Sound power levels are referenced to power rather than pressure; hence sound power levels are expressed in dB re 1 pW.

**Assessment Methodology**

**Policy and Guidance**

7.17 The following overarching planning documents have been material in determining the basis of this assessment:

- Noise Policy Statement for England (NPSE) (Department for Environment, Food and Rural Affairs (Defra), 2010)
National Planning Policy Framework (NPPF) ((Department for Communities and Local Government (DCLG), 2012)

Planning Practice Guidance – Noise (PPG-N) (DCLG, 2014)

Noise Policy Statement for England

7.18 The Noise Policy Statement for England (NPSE) (Defra, 2010) sets out the long term overarching vision of Government noise policy, which is to promote good health and a good quality of life through the management of noise within the context of Government policy on sustainable development. Whilst the NPSE does not seek to change pre-existing policy, the document is intended to aid decision makers by making explicit the implicit underlying principles and aims regarding noise management and control that are to be found in existing policy documents, legislation and guidance.

7.19 Where existing policy and guidance does not provide adequate guidance then decision makers can go back to the aims of the policy statement to provide overriding guidance. The “Noise Policy Vision” is to “promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development”. This long term vision is supported by the following aims, through effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

i) avoid significant adverse impacts of health and quality of life;

ii) mitigate and minimise adverse impacts on health and quality of life; and

iii) where possible, contribute to the improvement of health and quality of life.

7.20 The aims of the policy differentiate between noise impacts on health (e.g. sleep disturbance, hypertension, stress etc.) and noise impacts on quality of life (e.g. amenity, enjoyment of property etc.). The aims also differentiate between “significant adverse impacts” and “adverse impacts”. The explanatory note to the NPSE clarifies that a significant adverse impact is deemed to have occurred if the “Significant Observed Adverse Effect Level” (SOAEL) is exceeded. An adverse effect, on the other hand, lies between the “Lowest Observed Adverse Effect Level” (LOAEL) and the SOAEL.

National Planning Policy Framework

7.21 The National Planning Policy Framework (NPPF) sets out the Government’s planning policies for England and how these are expected to be applied (DCLG, 2012). The emphasis of the Framework is to allow development to proceed where it can be demonstrated to be sustainable. In relation to noise, Paragraph 123 of the Framework states:

“123. Planning policies and decisions should aim to:

avoid noise from giving rise to significant 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 developments, 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.”

Planning Practice Guidance - Noise

7.22 Planning Practice Guidance on Noise (PPG-N) (DCLG, 2014) provides guidance to local planning authorities to ensure effective implementation of the planning policy set out in the National Planning Policy Framework. The PPG-N reiterates general guidance on noise policy and assessment methods provided in the NPPF, NPSE and British Standards (BSs) and contains examples of acoustic environments commensurate with various effect levels. Paragraph 006 of the PPG-N explains that:

“The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation.”

7.23 According to the PPG-N, factors that can influence whether noise could be of concern include:

- the source and absolute level of the noise together with the time of day it occurs;
- for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- the spectral content and the general character of the noise;
- the local topology and topography along with the existing and, where appropriate, the planned character of the area;
- where applicable, the cumulative impacts of more than one source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration;
- whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time;
- in cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise level may result in a significant adverse effect occurring even though little to no change in behaviour would be likely to occur;
where relevant, Noise Action Plans, and, in particular the Important Areas identified through the process associated with the Environmental Noise Directive and corresponding regulations;

7.24 The PPG-N provides a relationship between various perceptions of noise, effect level and required action in accordance with the NPPF. This is reproduced in Table 7.1, below.

<table>
<thead>
<tr>
<th>Perception</th>
<th>Examples of Outcomes</th>
<th>Increasing Effect Level</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not noticeable</td>
<td>No Effect</td>
<td>No Observed Effect</td>
<td>No specific measures required</td>
</tr>
<tr>
<td>Noticeable and not intrusive</td>
<td>Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.</td>
<td>No Observed Adverse Effect</td>
<td>No specific measures required</td>
</tr>
<tr>
<td>Lowest Observed Adverse Effect Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noticeable and intrusive</td>
<td>Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.</td>
<td>Observed Adverse Effect</td>
<td>Mitigate and reduce to a minimum</td>
</tr>
<tr>
<td>Significant Observed Adverse Effect Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noticeable and disruptive</td>
<td>The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.</td>
<td>Significant Observed Adverse Effect</td>
<td>Avoid</td>
</tr>
<tr>
<td>Noticeable and very disruptive</td>
<td>Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.</td>
<td>Unacceptable Adverse Effect</td>
<td>Prevent</td>
</tr>
</tbody>
</table>
7.25 The PPG-N describes sound that is not noticeable to be at levels below the No Observed Adverse Effect Level (NOEL). It describes exposures that are noticeable but not to the extent there is a perceived change in quality of life as below the LOAEL and need no mitigation. With reference to the definition of noise in the NPSE, such immissions are ‘sound’ and not ‘noise’. On this basis, the audibility of sound from a development is not, in itself, a criterion to judge noise effects that is commensurate with national planning policy.

7.26 In line with the NPPF and NPSE, the PPG-N states that consideration needs to be given to mitigating and minimising effects above the LOAEL but taking account of the economic and social benefits being derived from the activity causing the noise. It goes on to state that the effects above the SOAEL should be avoided and that whilst the economic and social benefits that are derived from the activity causing the noise must be taken into account, such exposures are undesirable.

7.27 The PPG-N suggests that a noise impact may be partially offset if the residents of affected dwellings have access to a relatively quiet part of their dwelling, private external amenity area and/or external public or private amenity space nearby.

British Standard 5228 ‘Code of practice for noise and vibration control on construction and open sites’, Parts 1 and 2, 2009

7.28 British Standard (BS) 5228 is a two part standard which comprises:

- BS 5228-1:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites – Part 1: Noise’ (British Standards Institution, 2014a) and

7.29 The Standard provides guidance, information and procedures on the control of noise and vibration from demolition and construction sites. The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 approved BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 for the purpose of giving guidance on appropriate methods for minimising noise from construction and open sites in exercise of the powers conferred on the Secretary of State by sections 71(1)(b), (2) and (3) of the Control of Pollution Act 1974.

7.30 There are no set standards for the definition of the significance of construction noise effects, however, for noise, example criteria are provided in BS 5228-1:2009+A1:2014 Annex E and for vibration, example criteria are provided in BS 5228-2:2009+A1:2014 Annex B. The assessment of whether changes in noise levels due to construction activity constitute significant effects will be dependent on the absolute levels of ambient and construction noise, as well as the magnitude, duration, time of occurrence and frequency of the noise change.

7.31 BS 5228-1:2009+A1:2014 provides basic information and recommendations for methods of noise control relating to construction and open sites where work activities/operations generate significant noise levels. It includes sections on: community relations; noise and persons on site, neighbourhood nuisance; project supervision; and control of noise. However, annexes include: information on legislative background; noise sources, remedies and their effectiveness (mitigation
options); current and historic sound level data on site equipment and site activities; significance of noise effects; calculation procedures estimating sound emissions from sites and sound level monitoring; types of piling; and air overpressure.


7.32 British Standard 4142:2014 (British Standard Institute, 2014c) describes a method for rating and assessing sound of an industrial and/or commercial nature. The standard is applicable to the determination of the rating level of industrial or commercial sound as well as the ambient, background and residual noise levels for the purposes of investigating complaints, assessing sound from proposed new, modified or additional sources or assessing sound at proposed new dwellings. The determination of whether a noise amounts to a nuisance is beyond the scope of the standard, as is rating and assessment of indoor noise levels.

7.33 The standard compares the “rating level” of the noise (i.e. the specific noise level from the site under investigation adjusted using penalties for acoustic character such as tonality or impulsiveness) with the pre-existing background noise level.

7.34 The standard specifies that:

- typically, the greater the difference between rating level and background noise, the greater the magnitude of impact;

- a difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;

- a difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and

- the lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

7.35 The standard notes that where background sound levels and rating levels are both “low”, absolute noise levels might be as, or more, relevant than the margin by which the rating level exceeds the background, especially at night.

7.36 With regards to the rating correction, paragraph 9.2 of BS 4142:2014 (British Standards Institute, 2014c) states:

“Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention.”

7.37 The commentary to paragraph 9.2 of BS 4142:2014 suggests the following subjective methods for the determination of the rating penalty for tonal, impulsive and/or intermittent specific sounds:
"Tonality - For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a rating penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

Impulsivity – A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.

Other sound characteristics - Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Intermittency - When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. … If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."

7.38 BS 4142:2014 requires that the background sound levels adopted for the assessment be representative for the period being assessed. The Standard recommends that the background sound level should be derived from continuous measurements of normally not less than 15-minute intervals, which can be contiguous or disaggregated. However, the Standard states that there is no ‘single’ background sound level that can be derived from such measurements. It is particularly difficult to determine what is ‘representative’ of the night-time period is because it can be subject to a wide variation in background sound level between the shoulder night periods. The accompanying note to paragraph 8.1.4 states that:

“A representative level ought to account for the range of background sounds levels and ought not automatically to be assumed to be either the minimum or modal value.”

British Standard 8233 Guidance on Sound Insulation and Noise Reduction of Buildings

7.39 British Standard 8233:2014 (British Standards Institution, 2014d) has been used for many years for general guidance on acceptable noise levels in and around buildings. The latest revision to the standard, BS 8233:2014, provides guidance on design criteria for internal ambient noise levels in new (or refurbished) buildings. The scope of the standard states that should not be used to assess the effects of changes in the external noise level to occupants of an existing building.

7.40 In relation to external noise levels, the second paragraph of 7.7.3.2 states that:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB L_{Aeq,T} with an upper guideline value of 55 dB L_{Aeq,T} which would be acceptable in noisier environments..."
World Health Organisation (WHO) Guidelines

7.41 In 2009, a report was published presenting the conclusions of a World Health Organisation (WHO) working group responsible for preparing guidelines for exposure to noise during sleep entitled “Night Noise Guidelines for Europe” (European Centre for Environment and Health, 2009). The document can be seen as an extension to the original 1999 WHO Guidelines for Community Noise. Various effects are described including biological effects, sleep quality, and well-being. The document gives threshold levels for observed effects expressed as $L_{\text{max, inside}}$ and $L_{\text{night, outside}}$. The $L_{\text{night}}$ is a year-long average night-time noise level, not taking into account the façade effect of a building. In an exposed population a noise exposure of 40 dB $L_{\text{night, outside}}$ is stated as equivalent to the “lowest observed adverse effect level” for night noise. Above this level adverse health effects observed are self-reported sleep disturbance, environmental insomnia and increased use of somnifacient drugs and sedatives. Above 55 dB $L_{\text{night, outside}}$ cardiovascular effects become the major public health concern. Threshold levels for waking in the night, and/or too early in the morning are given as 42 dB $L_{\text{Amax, inside}}$. Lower thresholds are given that may change sleep structure.

7.42 It is relevant to note that taking into account typical night to night variation in noise levels that will often occur due to meteorological effects and the effects of a façade, the night noise guidelines are similar to those previously given in the 1999 WHO report (Berglund et al., 1999) (an external façade noise level of 45 dB $L_{\text{Aeq}}$), although defined in a different way.

7.43 The major concern in Europe is with respect to noise from transportation systems, and most of the studies on which these guidelines are based relate to this type of noise source. There can be no certainty that the same effects will be observed from noise of an industrial nature, but in the absence of any more detailed information some weight should be attached to the WHO guidance when assessing industrial noise as well.

Design Manual For Roads and Bridges Volume 11, Section 3, Part 7: Noise and Vibration

7.44 The ‘Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7’ (Highways Agency, 2011), provides guidance on the appropriate level of assessment to be used when assessing the noise and vibration impacts arising from all road projects including new construction, improvements and maintenance.

7.45 Generally a project should be considered for assessment if it alters the alignment of any existing carriageways including new sections of road, additional junctions and slip roads or if there is a change in traffic volume, traffic speed, proportion of heavy vehicles or changes in infrastructure surrounding the road that could cause a change in noise level of more than 1 dB(A); and if there are any dwellings within two kilometres of the project that would be subject to a change in noise or vibration. DMRB states that an increase in traffic flow by at least 25% or a decrease by 20% is equivalent to a 1 dB(A) change in noise level.

Consultation

7.46 RPS consulted with an Environmental Health Officer (EHO) at EDDC. The main purpose of the consultation was to discuss and agree the methodology for the assessment of operational noise
effects. A summary of the consultation response and how this has been addressed is provided in Table 7.2 below.

### Table 7.2: Consultation Responses Relevant to this Chapter

<table>
<thead>
<tr>
<th>Date</th>
<th>Consultee and Issues Raised</th>
<th>How / Where Addressed</th>
</tr>
</thead>
</table>
| 5th May 2016 | John Smith, EHO EDDC Raised concerns relating to the following potential operational noise and vibration effects:  
- Low frequency noise  
- Tonal noise content  
- Ground borne noise and vibration | Followed up initial correspondence with a telecon on 12th May 2015.  
RPS provided an overview of the type of equipment contained within a typical converter station and addressed the EHO's concerns regarding potential noise and vibration effects on the basis of the likely plant. It was agreed that low frequency noise and groundborne noise and vibration were unlikely to be of concern, but that there was potential for effects due to tonality from SGTs. Tonality from SGTs would be addressed using the subjective method in BS 4142:2014 (i.e. by adding a character correction, where applicable). This has been addressed further in the Assessment of Operational Impacts Section of this report. |

### Methodology

**Baseline Characterisation**

**Desk Study**

7.47 Existing noise sources for consideration within and around the site are: road traffic on the A30, the B3184 and other local roads; aircraft movements associated with Exeter Airport; and other light industrial activity from sites within the vicinity.

7.48 Significant existing levels of vibration within the vicinity of the site are unlikely. On this basis, existing vibration levels have been scoped out of the baseline study.

**Noise Sensitive Receptors**

7.49 The following noise sensitive receptors (NSRs) have been identified within the vicinity of the site and have been included within this assessment:

- The top bungalow, comprising three residential units approximately 250 m to the west of the site boundary
- Higher Southwood Farm, a residential properties approximately 350 m to the east of the site boundary
• Lower Southwood Farm, a residential property approximately 390 m to the east of the site boundary

• Deer Park, two residential properties approximately 450 m to the south-west of the site boundary

• Hampton-by-Hilton Exeter Airport, a hotel approximately 700 m to the west of the site boundary

• Several residential properties on Marwood Lane, approximately 800 m to the south-east of the site boundary

Baseline Sound Survey

7.50 The baseline sound climate has been determined at the locations of the NSRs described in the above section. Long-term sound monitors were installed by RPS at two locations, LT1 Higher Southwood Farm and LT2 The Top Bungalow on the 11th May 2016 and collected on the 19th May 2016. Data were logged of the Fast, A-weighted sound pressure level in 100 ms periods for the entire period of the surveys.

7.51 Short-term measurements were undertaken by RPS at four locations: ST1 Lower Southwood Farm; ST2 Marwood Lane; ST3 Deer Park; and ST4 Hampton-by-Hilton Hotel. At the short-term locations, 15-minute surveys were undertaken over several periods throughout the daytime and night-time periods. During the night-time it was observed at ST4 that the sound climate was similar to that at ST3; therefore night-time measurements at ST3 have been taken as representative of those at ST4.

7.52 Table 7.3 contains a summary of the baseline sound monitoring locations. The baseline sound survey locations are also provided in a plan in Figure 7.1. Specific details of survey locations and principal sound sources are provided later in the chapter under ‘Baseline Conditions’.

Table 7.3: Baseline Sound Monitoring Locations

<table>
<thead>
<tr>
<th>Ref</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT01</td>
<td>Higher Southwood Farm</td>
</tr>
<tr>
<td>LT02</td>
<td>The Top Bungalow, Antiques Centre</td>
</tr>
<tr>
<td>ST01</td>
<td>Lower Southwood Farm</td>
</tr>
<tr>
<td>ST02</td>
<td>Marwood Lane</td>
</tr>
<tr>
<td>ST03</td>
<td>Marwood, Deer Park and Deer Copse</td>
</tr>
<tr>
<td>ST04</td>
<td>Hampton by Hilton</td>
</tr>
</tbody>
</table>

7.53 Measurements were carried out using Rion NL 52 Sound Level Meters (SLMs). This is a Type 1 with high performance environmental windshields. BS 7445-2:1991 (British Standards Institution,
1991) recommends that sound level meters used for the acquisition of data pertinent to land use be preferably Type 1.

7.54 All instrumentation was checked for calibration prior to and following the measurements using a Rion NC 74 calibrator and there was no significant drift within the survey period. All equipment was within the two year BS 4142:2014 (British Standards Institution, 2014c) advisory calibration period at the time of the measurements. Calibration certificates are available on request.

7.55 Wind speed and direction during the survey period were recorded using a meteorological recording station, which was adjacent to the SLM at LT1.

Approach to the Assessment of Construction Impacts

Site Works

7.56 It is anticipated that construction noise impacts may arise from activities on site including, site clearance and ground works; piling; concrete pour, equipment installation; and from activities on the laydown site. The only potential vibration impact would be from piling works. Due to the separation distance between the main site and the nearest NSRs, vibration impacts from piling would be negligible, and therefore an assessment of vibration been scoped out.

7.57 A prediction of the noise levels from construction activities has been carried out using example method 2 contained within Annex E of BS 5228-1:2009+A1:2014 (British Standards Institution, 2014a). This suggests that: "Noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB L_{eq,T}, from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect."

7.58 Noise and vibration effects have also been qualified with respect to national planning guidance in the PPGN as provided in Table 7.1.

Construction Traffic on the Local Highways

7.59 The access route to the site is expected to be from the A30 Clyst Honiton junction, east along the B3184, left onto Long Lane adjacent to the entrance to Exeter Airport and along Long Lane. From the information provided it is anticipated that a maximum of 85 two-way HGV movements are expected to occur during the construction phase, although this is only likely to occur for one month. An average over the whole 2 ½ year construction programme is 40 movements.

7.60 The quanta of HGVs expected would not cause a noise change of 1 dB or more from traffic on the A30, and therefore, following the guidance in DMRB, a noise change assessment of traffic on the A30 would not be required. There are no residential properties adjacent to the B3184 and Long Lane. Traffic on the A30 is The Hilton Hotel has line-of-sight to Long Lane. However, HGV movements would occur during standard daytime construction hours, and hotels are not particularly sensitive. The Antiques Complex at Harrier Court is shielded from Long Lane by other buildings, so would not be particularly sensitive to traffic changes on Long Lane. Furthermore, at the majority of NSRs, the main contributor to noise is traffic movements on the A30.
7.61 With consideration of the above, significant impacts from construction traffic are unlikely and a numerical assessment of noise from construction traffic has been scoped out.

**Approach to the Assessment of Operational Impacts**

**Noise**

7.62 The converter station is assumed to operate relatively continuously over a 24-7 period. Therefore one specific sound level has been assumed across all operating times and periods. Assessments have been carried out against representative background sound levels for the daytime (07:00 to 23:00 hours) and night-time (23:00 and 07:00 hours) as determined from the baseline sound monitoring.

7.63 The main sound sources at an HVDC converter station are:

- the Converter Hall(s) that contain the Voltage Source Converter (VSC) system, which may be around 20 m tall;
- Super Grid Transformers (SGTs); and
- Cooling plant (fans and radiators) associated with the Converter Hall(s), the VSC system (Valve Cooling Radiators (VCRs)) and the SGTs.

7.64 Specific sound immissions from the site have been predicted at the NSRs identified in paragraph 7.49 using SoundPLAN Version 7.4 sound modelling software utilising the propagation method contained in ISO 9613-2:1996 'Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation' (International Organisation for Standardisation, 1996). Source data has been derived from typical sound levels based on data contained within National Grid Technical Specification (TS 2.03) 'Transformers and Reactors'; the public domain documents of the Environmental Statement (ES) that accompanied Project 1 of the Hornsea Offshore Wind Farm (Smartwind, 2013), which includes an HVDC converter station at its onshore grid connection; manufacturers' data obtained during previous RPS projects; and RPS measurements of sound emissions at operational substations.

7.65 Details of the source data used for the assessment are provided in Appendix 7.1 and a plan indicating the location of the plant is provided in Figure 7.2 for Option 1 and 8.3 for Option 2. Assumed specifications for the sound insulation of the facades of building have also been provided. These are also provided in Appendix 7.1.

7.66 Both options have been modelled. For both options the following mitigation measures have been incorporated into the design:

- Mounting of the SGTs in an enclosure.

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1 The act of immitting, or of sending in; injection; - the correlative of emission.
• Location of cooling plant associated with the converter all away from the nearest NSRs.

7.67 Standard meteorological conditions and a ground factor of 0 (hard ground) for the site and 1 (soft ground) for the surrounding land have been used in the model. For each group of NSRs, a single location has been modelled, which is representative of the closest NSRs to the site within that group. Predictions have been made at 1.5 m above local ground level.

7.68 At each NSR, the rating level has been determined from the predicted specific sound level. The main sound sources have a strong tonal component at 100 Hz. Although mitigation measures have been put in place to reduce the impacts of the tonal component, tonality at 100 Hz and the 200 Hz and 300 Hz harmonics could still be noticeable at the closest NSRs, particularly as background sound levels are very low. The maximum rating penalty applicable under paragraph 9.2 of BS 4142:2014 for tonality is +6 dB, corresponding to a sound that is highly perceptible. Therefore for robustness a character correction of +6 dB has been applied at all locations. Impulsive and/or intermittent sounds are not expected to occur; therefore no further character corrections have been applied.

7.69 The significance of the effect of the noise in question (i.e. whether above or below SOAEL and LOAEL) should be determined on the basis of the initial estimate of impact significance from the BS 4142:2014 assessment with reference to the examples of outcomes described within the PPGN and after having considered the context of the sound. All pertinent factors have been considered, including:

• the absolute level of the sound;

• the character and level of the residual sound compared to the character and level of the specific sound; and

• the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

Vibration

7.70 The plant associated with the proposed development would not generate sufficient levels of vibration that would result in potential vibration impacts. Therefore an assessment of operational vibration has been scoped out.

Limitations of the Assessment

7.71 In all assessments, it is good practice to consider uncertainty, which can arise from a number of different aspects of an assessment. There is a degree of uncertainty associated with: the instrumentation itself; the use of instrumentation, i.e. the measurements; the source terms used; the sound propagation model; and the subjective response of residents to the sound sources.

7.72 Uncertainty due to instrumentation error has been significantly reduced with the introduction of modern instrumentation and is reduced further by ensuring that all instrumentation is calibrated before and after each measurement period and is within accepted calibration intervals.
7.73 Uncertainty in the baseline data has been reduced significantly by carrying out baseline sound monitoring over a period of seven days in some locations, allowing analysis of how representative the baseline data is given the naturally varying sound level at NSRs within the vicinity of the site.

7.74 The specific plant associated with the final design has not been procured at present. Therefore the assessment is based upon RPS’ experience of and available data for typical plant operating on similar sites. These data are estimates of realistically achievable sound levels although the final selection may vary from that which has been modelled.

7.75 With regard to subjective response, the acoustics standards and guidance adopted for the assessments within this chapter are based on the subjective response of the majority of the population. This is the best that can be achieved in a population of varying subjective responses, which are dependent upon a wide range of factors.

7.76 Sound immissions at NSRs have been calculated using the prediction methodology in ISO 9613-2:1996. For source heights up to 30 m and prediction distances between 100 and 1000 m, ISO 9613-2:1996 claims accuracy of +/-3 dB. ISO 9613-2 is widely used for the prediction of industrial noise and is recommended in paragraph 1.5.3.2 of EA’s Horizontal Guidance - H3 Part 2 Noise Assessment and Control and referred to in BS 4142:2014.

7.77 On the basis of the above, whilst the magnitude of uncertainty has not been quantitatively defined, measures have been taken to minimise this aspect in accordance with best practice, and that the results provide a robust estimate of the likely noise effects of the development.

Baseline Conditions

7.78 Summaries of the locations of the baseline sound surveys and principal sound sources are provided in Table 7.4. Tabulated baseline survey data and graphical plots of data at the locations of long-term surveys (L1 and L2) are provided in Appendix 7.2.

Table 7.4: Baseline Sound Monitoring Locations

<table>
<thead>
<tr>
<th>Ref</th>
<th>Location</th>
<th>Position</th>
<th>Principal Sound Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT01</td>
<td>Higher Southwood Farm</td>
<td>Free-field</td>
<td>Aircraft taking off/landing, use of farm machinery, local road traffic, distant road traffic, bird calls.</td>
</tr>
<tr>
<td>LT02</td>
<td>The Top Bungalow, Antiques Centre</td>
<td>Free-field</td>
<td>Aircraft taking off/landing, road traffic, bird calls.</td>
</tr>
<tr>
<td>ST01</td>
<td>Lower Southwood Farm</td>
<td>Free-field</td>
<td>Aircraft taking off/landing, aircraft overhead, local road traffic, distant road traffic, bird calls.</td>
</tr>
<tr>
<td>ST02</td>
<td>Marwood Lane</td>
<td>Free-field</td>
<td>Local road traffic, distant road traffic, aircraft, bird calls.</td>
</tr>
<tr>
<td>ST03</td>
<td>Marwood, Deer Park and Deer Copse</td>
<td>Free-field</td>
<td>Local road traffic, distant road traffic, aircraft, bird calls.</td>
</tr>
</tbody>
</table>
The graphical plots in Appendix 7.2 for locations LT01 and LT02 provide an indication of the weather conditions during the monitoring. There was no significant correlation between unfavourable weather and monitored sound levels; therefore, data have not been removed from the dataset due to unfavourable weather.

For the long-term surveys, representative background sound levels (L_{A90}) for the daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods have been determined from the 25th percentile of the 15-minute data for the respective period. As there was a large range of background sound levels, and it was not clear what the differences therein should be attributed to, so it was considered to be more robust to use the 25th percentile of the background sound level than the average to obtain a background sound level in this case. Ambient/residual (L_{Aeq}) sound levels have been determined as the linear average of the data for each full daytime/night-time period. It was noted that there was less variation in the ambient/residual levels, so the average was deemed to be representative.

For the short-term measurements, the monitored levels have been compared to the sound levels measured over the corresponding period at the nearest long-term location. A correction has been then be applied to the short-term measured data to obtain representative background and ambient levels corresponding to the difference between the concurrent level measured at the nearest long-term location and the representative level at the nearest long-term location.

A summary of the sound levels used for the assessment are provided in Table 7.5 below.

### Table 7.5: Summary of Typical Baseline Sound Levels

<table>
<thead>
<tr>
<th>Location</th>
<th>Period</th>
<th>Typical Baseline Sound Levels dB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Ambient / Residual L_{Aeq}</td>
</tr>
<tr>
<td>01 Higher Southwood Farm</td>
<td>Daytime (07:00 – 23:00)</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Night-time (23:00 – 07:00)</td>
<td>53</td>
</tr>
<tr>
<td>02 The Top Bungalow, Antiques Centre</td>
<td>Daytime (07:00 – 23:00)</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Night-time (23:00 – 07:00)</td>
<td>51</td>
</tr>
<tr>
<td>03 Lower Southwood Farm</td>
<td>Daytime (07:00 – 23:00)</td>
<td>61</td>
</tr>
</tbody>
</table>
### Assessment of Construction Impacts

7.83 The predicted construction noise levels are provided in Appendix 7.3 and summarised in Table 7.6 below.

#### Table 7.6: Predicted Construction Noise levels at NSRs

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing Daytime Ambient Sound Level $L_{Aeq,16hr}$</th>
<th>Predicted Construction Noise Levels $L_{Aeq,1hr}$ (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Site Clearance and Ground Works</td>
</tr>
<tr>
<td>01 Higher Southwood Farm</td>
<td>57</td>
<td>47</td>
</tr>
<tr>
<td>02 The Top Bungalow, Antiques Centre</td>
<td>57</td>
<td>50</td>
</tr>
<tr>
<td>03 Lower Southwood Farm</td>
<td>61</td>
<td>46</td>
</tr>
<tr>
<td>04 Marwood Lane</td>
<td>60</td>
<td>38</td>
</tr>
<tr>
<td>05 Marwood, Deer Park and Deer Copse</td>
<td>61</td>
<td>44</td>
</tr>
<tr>
<td>06 Hampton by Hilton</td>
<td>66</td>
<td>39</td>
</tr>
</tbody>
</table>
The majority of construction works will take place within standard hours of 07:00 to 19:00 on Mondays to Fridays and 07:30 to 13:00 on Saturdays and it is likely that working hours will be restricted by a planning condition. On that basis, prior written consent from EDDC to carry out noise generating works outside these hours would be required. This is commonly achieved either through the submission and approval of a formal application under Section 61 of the Control of Pollution Act 1974 or through an agreed method statement in line with the Control of Pollution Act.

From Table 7.5, with the exception of Location 06 Hampton by Hilton, the ambient sound levels do not exceed 65 dB $L_{Aeq,1hr}$. Therefore from BS 5228-1:2009+A1:2014 (British Standards Institution, 2014a, 2014b), the construction noise criteria for standard hours would be 70 dB $L_{Aeq,1hr}$. The levels within Table 7.6 all fall well below this criteria, and therefore it is not expected that significant impacts according to the criteria in BS 5228-1:2009+A1:2014 will occur due to construction noise.

Sound levels are also predicted to be, in most cases, below existing ambient sound levels, with the only exception occurring at 02 The Antiques Complex at Harrier Court, where existing ambient sound levels would be exceeded due to activities on the adjacent laydown site. However, this assessment presents a worst-case scenario and does not account for any screening from site hoarding that may be included as mitigation for noise.

As discussed previously, there are four key questions which need to be answered to determine whether the Government’s noise policy aims have been met for a development:

a) is there a significant adverse impact to health;

b) is there a significant adverse impact to quality of life;

c) is there an adverse impact to health; or

d) is there an adverse impact to quality of life?

If the answer to question a. or b. is yes, then the NPSE provides a clear guidance that the development should be viewed as being unacceptable. If the answer to question c. or d. is yes, then the NPSE provides a clear steer that the impact should be mitigated and minimised. It follows that if the answer to all four questions is “no” then the proposed development should normally be viewed as acceptable on noise grounds.

Noise from the proposed development at nearby properties will be above the ambient noise level of 55 dB $L_{Aeq,T}$ specified in WHO guidance for the onset of annoyance during the daytime. Thus, taking the absolute noise level assessment into consideration, construction of the proposed development would result in an adverse impact on quality of life, albeit this would be a temporary impact.

With respect to the NPPF, NPSE and PPGN it is anticipated that noise will be heard in some locations, but would not cause any change in behaviour or attitude and could slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.
Therefore with respect to national planning guidance, the noise levels may be above the LOAEL, but would be below the SOAEL. From the NPSE, noise levels above the LOAEL and below the SOAEL should be mitigated and minimised to reduce the potential for adverse impacts on health and quality of life.

**Assessment of Operational Impacts**

**Option 1**

7.91 The predicted specific sound levels for Option 1 are provided below and a noise contour plot is provided in Figure 7.4. An assessment has been carried out at the closest NSRs to the site for both the daytime (07:00 to 23:00 hrs) and night-time (23:00 to 07:00 hrs) periods. The results of the BS 4142:2014 assessment for the daytime and night-time periods are provided in Table 7.7 and Table 7.8 below.

<table>
<thead>
<tr>
<th>Location</th>
<th>Predicted Specific Sound Level $L_S$ dB</th>
<th>Character Correction (dB)</th>
<th>Rating Level $L_{A,Tr}$ dB</th>
<th>Background Sound Level $L_{A90}$ dB</th>
<th>Residual Sound Level $L_{Aeq}$ dB</th>
<th>Difference between Rating and Background Sound Level $L_{Aeq}$ dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Higher Southwood Farm</td>
<td>26</td>
<td>6</td>
<td>32</td>
<td>43</td>
<td>57</td>
<td>-11</td>
</tr>
<tr>
<td>02 The Top Bungalow, Antiques Centre</td>
<td>29</td>
<td>6</td>
<td>35</td>
<td>46</td>
<td>57</td>
<td>-11</td>
</tr>
<tr>
<td>03 Lower Southwood Farm</td>
<td>23</td>
<td>6</td>
<td>29</td>
<td>47</td>
<td>61</td>
<td>-18</td>
</tr>
<tr>
<td>04 Marwood Lane</td>
<td>20</td>
<td>6</td>
<td>26</td>
<td>38</td>
<td>60</td>
<td>-12</td>
</tr>
<tr>
<td>05 Marwood, Deer Park and Deer Copse</td>
<td>20</td>
<td>6</td>
<td>26</td>
<td>49</td>
<td>61</td>
<td>-23</td>
</tr>
<tr>
<td>06 Hampton by Hilton</td>
<td>21</td>
<td>6</td>
<td>27</td>
<td>57</td>
<td>66</td>
<td>-30</td>
</tr>
</tbody>
</table>
Table 7.8: BS 4142 Assessment Night-time (07:00 – 23:00 hrs)

<table>
<thead>
<tr>
<th>Location</th>
<th>Predicted Specific Sound Level $L_s$ dB</th>
<th>Character Correction (dB)</th>
<th>Rating Level $L_{A,T}$, dB</th>
<th>Background Level $L_{A90}$ dB</th>
<th>Residual Sound Level $L_{Aeq}$ dB</th>
<th>Difference between Rating and Background Sound Level dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Higher Southwood Farm</td>
<td>26</td>
<td>6</td>
<td>32</td>
<td>30</td>
<td>53</td>
<td>+2</td>
</tr>
<tr>
<td>02 The Top Bungalow, Antiques Centre</td>
<td>29</td>
<td>6</td>
<td>35</td>
<td>33</td>
<td>51</td>
<td>+2</td>
</tr>
<tr>
<td>03 Lower Southwood Farm</td>
<td>23</td>
<td>6</td>
<td>29</td>
<td>32</td>
<td>53</td>
<td>-3</td>
</tr>
<tr>
<td>04 Marwood Lane</td>
<td>20</td>
<td>6</td>
<td>26</td>
<td>33</td>
<td>45</td>
<td>-7</td>
</tr>
<tr>
<td>05 Marwood, Deer Park and Deer Copse</td>
<td>20</td>
<td>6</td>
<td>26</td>
<td>31</td>
<td>54</td>
<td>-5</td>
</tr>
<tr>
<td>06 Hampton by Hilton</td>
<td>21</td>
<td>6</td>
<td>27</td>
<td>33</td>
<td>51</td>
<td>-6</td>
</tr>
</tbody>
</table>

7.92 From Table 7.7, during the daytime period the difference between the rating and the background sound level ranges between -11 dB and -30 dB. From Table 7.8, during the night-time period, the difference between the rating and background sound level ranges between -7 dB and +2 dB.

7.93 With reference to the commentary in paragraph 7.36, during the daytime it is predicted that the level of rating noise is sufficiently below the existing background sound level that significant impacts as outlined in BS 4142:2014, would not be expected to occur. During the night time the difference between the rating levels and background sound levels are all below the margin of 5 dB that is likely to be an indication of adverse impact, though some exceed the level of 0 dB that is an indication of a low impact. Therefore the context is important when considering the impacts.

7.94 The locations at which the rating level exceeds the background sound level are 01 Higher Southwood Farm and 02 The Antiques Complex at Harrier Court, both by a margin of 2 dB.

Option 2

7.95 The predicted specific sound levels for Option 2 are provided below and a noise contour plot is provided in Figure 7.5. An assessment has been carried out at the closest NSRs to the site for both the daytime (07:00 to 23:00 hrs) and night-time (23:00 to 07:00 hrs) periods. The results of
the BS 4142:2014 assessment for the daytime and night-time periods are provided in Table 7.9 and Table 7.10 below.

### Table 7.9: BS 4142 Assessment Daytime (07:00 – 23:00 hrs)

<table>
<thead>
<tr>
<th>Location</th>
<th>Predicted Specific Sound Level $L_s$ dB</th>
<th>Character Correction (dB)</th>
<th>Rating Level $L_{A_{r,T}}$ dB</th>
<th>Background Sound Level $L_{A90}$ dB</th>
<th>Residual Sound Level $L_{Aeq}$ dB</th>
<th>Difference between Rating and Background Sound Level dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Higher Southwood Farm</td>
<td>27</td>
<td>6</td>
<td>33</td>
<td>43</td>
<td>57</td>
<td>-10</td>
</tr>
<tr>
<td>02 The Top Bungalow, Antiques Centre</td>
<td>30</td>
<td>6</td>
<td>36</td>
<td>46</td>
<td>57</td>
<td>-10</td>
</tr>
<tr>
<td>03 Lower Southwood Farm</td>
<td>28</td>
<td>6</td>
<td>34</td>
<td>47</td>
<td>61</td>
<td>-13</td>
</tr>
<tr>
<td>04 Marwood Lane</td>
<td>19</td>
<td>6</td>
<td>25</td>
<td>38</td>
<td>60</td>
<td>-13</td>
</tr>
<tr>
<td>05 Marwood, Deer Park and Deer Copse</td>
<td>21</td>
<td>6</td>
<td>27</td>
<td>49</td>
<td>61</td>
<td>-22</td>
</tr>
<tr>
<td>06 Hampton by Hilton</td>
<td>24</td>
<td>6</td>
<td>30</td>
<td>57</td>
<td>66</td>
<td>-27</td>
</tr>
</tbody>
</table>

### Table 7.10: BS 4142 Assessment Night-time (07:00 – 23:00 hrs)

<table>
<thead>
<tr>
<th>Location</th>
<th>Predicted Specific Sound Level $L_s$ dB</th>
<th>Character Correction (dB)</th>
<th>Rating Level $L_{A_{r,T}}$ dB</th>
<th>Background Sound Level $L_{A90}$ dB</th>
<th>Residual Sound Level $L_{Aeq}$ dB</th>
<th>Difference between Rating and Background Sound Level dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Higher Southwood Farm</td>
<td>27</td>
<td>6</td>
<td>33</td>
<td>30</td>
<td>53</td>
<td>+3</td>
</tr>
<tr>
<td>02 The Top Bungalow, Antiques Centre</td>
<td>30</td>
<td>6</td>
<td>36</td>
<td>33</td>
<td>51</td>
<td>+3</td>
</tr>
<tr>
<td>Location</td>
<td>Predicted Specific Sound Level LS dB</td>
<td>Character Correction (dB)</td>
<td>Rating Level LAr,Tr dB</td>
<td>Backgroun d Sound Level LA90 dB</td>
<td>Residual Sound Level LAeq dB</td>
<td>Difference between Rating and Background Sound Level dB</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------------------</td>
<td>---------------------------</td>
<td>------------------------</td>
<td>--------------------------------</td>
<td>----------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>03 Lower Southwood Farm</td>
<td>28</td>
<td>6</td>
<td>34</td>
<td>32</td>
<td>53</td>
<td>+2</td>
</tr>
<tr>
<td>04 Marwood Lane</td>
<td>19</td>
<td>6</td>
<td>25</td>
<td>33</td>
<td>45</td>
<td>-7</td>
</tr>
<tr>
<td>05 Marwood, Deer Park and Deer Copse</td>
<td>21</td>
<td>6</td>
<td>27</td>
<td>31</td>
<td>54</td>
<td>-4</td>
</tr>
<tr>
<td>06 Hampton by Hilton</td>
<td>24</td>
<td>6</td>
<td>30</td>
<td>33</td>
<td>51</td>
<td>-3</td>
</tr>
</tbody>
</table>

7.96 From Table 7.9, during the daytime period the difference between the rating and the background sound level ranges between -10 dB and -27 dB. From Table 7.10, during the night-time period, the difference between the rating and background sound level ranges between -7 dB and +3 dB.

7.97 With reference to the commentary in paragraph 7.35, during the daytime it is predicted that the level of rating noise is sufficiently below the existing background sound level that significant impacts as outlined in BS 4142:2014, would not be expected to occur. During the night-time the difference between the rating levels and background sound levels are all below the margin of 5 dB that is likely to be an indication of adverse impact, though some exceed the level of 0 dB that is an indication of a low impact. Therefore the context is important when considering the impacts.

7.98 The locations at which the rating level exceeds the background sound level are 01 Higher Southwood Farm; 02 The Antiques Complex at Harrier Court and 03 Lower Southwood Farm, ranging from a margin of 2 to 3 dB.

Discussion

7.99 From above, Option 1 is the more favourable with respect to noise, with predicted specific sound levels ranging between 5 dB LS lower and 1 dB LS higher than those in Option 2. However, taking these differences into consideration, the noise impacts of the two would be relatively similar and therefore the assessment of impacts below has been carried out in relation to both schemes.

7.100 Paragraph 7.68 of this chapter states the factors that BS 4142:2014 requires to be taken into consideration when assessing the context of the sound, including the absolute level of sound, the character and level of the sound compared to existing residual sound levels and the sensitivity of the receptor. The absolute level of the sound is low, with the highest level of specific sound at 29 dB LS for Option 1 and 30 dB LS for Option 2. This is well below existing residual levels. However as the majority of the sound is at 100 Hz and the 200 Hz and 300 Hz harmonics, there is potential...
that tonal aspects of the sound would be audible. At night-time, the main impact of concern is
sleep disturbance, and therefore it is sensible to assume the impacts would occur inside a
residential bedroom. Based on the guidance contained within the Napier University Report
NANR 116 (Napier University, 2007) a standard residential partially open window would provide a sound
attenuation of around 10 dB at frequencies of 100 and 200 Hz. Therefore, the absolute level of
sound would likely be around 20 dB L_{Aeq,T} or lower in this context.

7.101 Table 4 of BS 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’ (British
Standards Institution, 2014d) provides a guidance values for indoor ambient noise levels within
dwellings for sleeping during the night-time of 30 dB L_{Aeq,8hr}, noting that lower levels may be
appropriate for noise of a specific character, including tonal noise. The anticipated internal levels
from transformer sound are well below this threshold and, even accounting for the character of
the sound should be acceptable in this context. Therefore with consideration for the context a low
adverse impact as defined by BS 4142 criteria is expected.

7.102 As discussed previously, there are four key questions which need to be answered to determine
whether the Government’s noise policy aims have been met for a development:

a) is there a significant adverse impact to health;

b) is there a significant adverse impact to quality of life;

c) is there an adverse impact to health; or

d) is there an adverse impact to quality of life?

7.103 If the answer to question a. or b. is yes, then the NPSE provides a clear guidance that the
development should be viewed as being unacceptable. If the answer to question c. or d. is yes,
then the NPSE provides a clear steer that the impact should be mitigated and minimised. It
follows that if the answer to all four questions is “no” then the proposed development should
normally be viewed as acceptable on noise grounds.

7.104 With respect to the impacts of noise on health, it is the impact on sleep that is likely to be the
primary concern. The absolute noise level assessment shows that noise from the proposed
development can be mitigated so that specific noise from the plant will be below the WHO
guideline limits for onset of sleep disturbance. It can therefore be concluded that there will be no
adverse impact on health due to operational noise from the development.

7.105 Although noise from the development could be audible to some residents living in close proximity
during the quietest period of the night, it is the daytime and evening periods that are of greatest
concern with respect to the impact on quality of life (amenity, enjoyment of property etc.). This is
because people will tend to be indoors or asleep during the night, whereas during the day and
evening they are more likely to be using outdoor spaces for amenity purposes.

7.106 Noise from the proposed development at nearby properties will be significantly less than the
ambient noise level of 55 dB L_{Aeq,T} specified in WHO guidance for the onset of annoyance during
the daytime. Thus, taking both the change in noise level and the absolute noise level
assessment into consideration, the proposed development will not result in an adverse impact on quality of life.

7.107 The BS 4142 assessment indicates that noise from the development is unlikely to result in a low adverse impact during the daytime, evening or night-time. It can therefore be concluded that noise impacts are reduced to a minimum through use of appropriate mitigation, as set out in paragraph 7.66.

7.108 It is an important consideration that any noise impact from the development is only likely to take place during periods of peak electricity demand and that the impacts due to noise, modelled as part of this assessment, have been based on worst case assumptions, such as the receiver location always being down-wind from the site. In reality, this is unlikely to be the case and there would be substantial periods when noise levels are less than predicted and assessed in this report.

7.109 Taking the above factors into consideration, it is concluded that noise from the development is unlikely to result in an adverse impact at any of the nearby noise sensitive receptors. In the event that noise from the site is audible, it is unlikely to cause any changes in behaviour or attitude or a perceived change in quality of life. Therefore with respect to national planning guidance in the NPPF, NPSE and PPGN, it is unlikely that the level of noise would exceed the LOAEL. With respect to the guidance in the NPSE, the noise has been mitigated and minimised such that it is unlikely to have an adverse impact on health or quality of life.

Proposed Mitigation Measures

Construction Noise Impacts

7.110 Construction works would follow Best Practicable Means (BPM) outlined in Section 72 of the Control of Pollution Act 1974 (as amended) to minimise noise and vibration impacts. Such details would be recorded in the Code of Construction Practice (CoCP) submitted with the application which would subsequently inform a Construction Environmental Management Plan (CEMP). The CEMP would be submitted to and agreed in writing with EDDC prior to commencement of construction activities and following the appointment of a contractor. The following mitigation measures for noise and vibration are provided within the draft CoCP (Chapter 11). These are based upon the guidance contained in BS 5228:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites – Part 1: Noise’ and ‘Part 2: Vibration’ ((British Standards Institution, 2014a, 2014b):

- **Communication:** A Local Liaison Committee will be established, and occupiers of residential and business properties that are likely to be affected by the works will be notified in advance of the works. A named individual will be appointed to take primary responsibility for the day-to-day implementation of the CEMP during the construction phase and to act as the first point of contact on environmental matters for EDDC, other external bodies and the general public. Information regarding the nature and duration of the works, and named contact details for key members of staff will be displayed on a noticeboard near to the site.
• **Standard construction hours:** From Chapter 2 Project Description, core working hours would be 07:00 to 19:00 hours Monday to Friday, 07:30 to 13:00 hours on Saturday and at no time on Sundays or on public or bank holidays. In the event that noise generating works are required outside of core working hours, this would be agreed with EDDC prior to commencement of the activity. In such instances the contractor would apply to EDDC for written consent prior to work commencing by submitting either a Section 61 consent application or an agreed method statement in line with the Control of Pollution Act.

• **Access routes:** Vehicles will follow the prescribed access route to the site from the A30 Clyst Honiton junction, east along the B3182, left onto Long Lane adjacent to the entrance to Exeter Airport and along Long Lane.

• **Equipment:** Quieter alternative methods, plant and equipment will be used, where reasonably practicable, as required by the CEMP.

• **Worksite:** Plant, equipment, site offices, storage areas and worksites will be positioned away from existing NSRs, where reasonably practicable.

• **Screening:** Portable acoustic enclosures/screens will be used, as required.

• **Maintenance:** All vehicles, plant and equipment will be maintained and operated in an appropriate manner, to ensure that extraneous noise from mechanical vibration, creaking and squeaking is kept to a minimum.

### Operational Noise Impacts

7.111 As identified in paragraph 7.65 it has been assumed that the following mitigation measures would be included in the design:

- Installation of the SGTs in acoustic enclosures.
- Location of cooling plant associated with the converter away from the nearest NSRs.

7.112 Assessments have been carried out of the two options using data from other similar plant. These have demonstrated that operational noise can be controlled sufficiently such that the site would comply with the NPPF, NPSE and PPGN.

7.113 Notwithstanding this, it is not known which equipment or site design will be utilised. Consequently, it is difficult to specify the exact noise mitigation measures that will be installed. Detailed specification for noise control cannot be provided at this stage of the project. However, the choice of and specification for any mitigation measures will be verified post-consent once the equipment specifications and design have been finalised. Different types of mitigation could be appropriate depending on the final design and this will be specified during the detailed design phases of the project to ensure that noise effects on health and quality of life will be minimised as much as is reasonably practical. A planning condition requesting details of plant to be included in the design and noise mitigation measures to be implemented would ensure that suitable controls are incorporated into the final plant selection and design.
Cumulative Effects

7.114 A review of committed and proposed third party projects that may have a cumulative impact with the development proposals has been undertaken and used to inform this Environmental Report. The projects identified are shown on Figure 2.9 and details are listed in Appendix 2.2.

7.115 Cumulative noise and vibration impacts during both the construction and operational phase are only likely to occur for schemes that are within 1 km of the site. The following developments within 1 km of the converter station site have been identified and have therefore been examined as part of the assessment:

- **Site 1**: 16/1578/MFUL. Proposed Industrial unit, roadways, parking and infrastructure.
  Mcbains Business Units Road Past Exeter Airport Clyst Honiton Exeter EX5 2BA;

- **Site 2**: 15/0046/MOUT. The expansion of Cranbrook comprising up to an additional 1,550 residential dwellings, 40,000 sq m of employment (B1, B2, B8), one 2-form entry primary school, a local centre comprising of up to 1,000sq m of A1 uses plus A2, A3, A4, A5 uses and up to 1,250sq m B1 business use. Sports and recreation facilities including children's play, green infrastructure (including open space), community uses (including non-residential institutions), assembly and leisure. Access from former A30, landscaping, allotments, engineering (including ground modelling and drainage) works, demolition, associated infrastructure and car parking for all uses. All matters reserved except access.
  Cranbrook Expansion Site South Lane To Treasbeare Farm Clyst Honiton

7.116 Site 2 is a residential development and therefore would also be considered as an NSR within the operational noise assessment.

Construction Phase

7.117 During the construction phase, cumulative impacts are only likely to occur in the area where the developments have common NSRs within close proximity (circa 500 m) of both developments. The only scheme within this proximity of the development is Site 1 above. Cumulative impacts would then only be experienced if construction works on both schemes were to take place simultaneously. Effective implementation of relevant mitigation measures at both sites should ensure the risk of cumulative noise and vibration impacts is minimal and as a result cumulative impacts are not anticipated to be significant during the construction phase.

Operational Phase

7.118 The information relating to the application for Site 1 indicates that this is a light industrial unit. A noise assessment was not submitted as part of the planning application, which is an indication that noise effects were not anticipated from this site. There is potential for there to be some noise generating plant associated with this site such as heating and cooling plant. However, this would have to be suitably located or designed to ensure that there would be no noise impact at the closest NSR, '02 The Top Bungalow, Antiques Centre' which is only 20 m from the site. Therefore cumulative impacts with Site 1 are expected to be minimal.
Site 2 is a residential development. The only likely impact in the operational phase from residential development is an increase in road traffic. As there are no road traffic noise impacts associated with the operation of the HVDC converter station, then there will be no comparable operational noise impacts between the two developments.

Site 2 can also be considered as an NSR. It is at 900 m from the converter station site. From Table 7.7, the predicted specific sound level at NSR '04 Marwood Lane,' which is a comparable distance away from the site albeit to the south-east, is 20 dB $L_S$. The predicted rating level, which accounts for the tonality of the sound is 26 dB $L_{A, Tr}$. The prevailing night-time background sound levels in the area ranged between 30 and 33 dB $L_{A90, T}$. Therefore the rating level is very low and would be sufficiently below background sound levels that noise impacts would not occur at new residential sites in the area.

On the basis of the above, cumulative noise and vibration impacts are not expected to occur with other developments in the vicinity of the site, and in the event that they do, they would not be significant.

**Summary**

This chapter considers the potential for noise and vibration impacts from the proposed UK converter station. It contains the approach to the assessment; a description of the baseline noise environment; identification of those aspects of the proposed development that may cause noise and/or vibration impacts; predictions of noise propagation to the nearest Noise and Vibration Sensitive Receptors (NSRs) and assessments of the potential noise and/or vibration impacts. Mitigation measures are identified where necessary. The spatial scope of the assessment is focused on the nearest NSRs to the proposed substation.

An assessment of construction noise effects has been carried out in accordance with BS 5228-1:2009+A1:2014. The assessment indicates that, significant noise effects are unlikely. With reference to the Planning Practice Guidance for Noise (PPG-N), construction noise effects might be above the Lowest Observed Adverse Effect Level (LOAEL) but will be below the Significant Observed Adverse Effect Level (SOAEL).

Due to the separation distances from any piling activities, vibration effects are likely to be negligible and thus a full assessment of vibration effects has been scoped out of this chapter. With respect to national guidance in the PPGN, vibration effects are anticipated to be below the No Observed Effect Level (NOEL).

Mitigation for noise and vibration from construction activities is provided within the draft CoCP for the site based upon the guidance in BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014. Construction works will follow Best Practicable Means (BPM) outlined in Section 72 of the Control of Pollution Act 1974 (as amended)to minimise noise and vibration effects.

An assessment of the operational noise effects from both of the proposed options has been carried out in accordance with BS 4142:2014. The assessments indicate that for both options the rating level will be well below the background sound level during the daytime period. During the night-time period, the rating level would exceed the background sound level by up to a margin of 2 dB for Option 1 and 3 dB for Option 2. The context of the sound is also considered, and as the
actual predicted specific sound levels are low, the overall impact is expected to be low. With respect to national planning guidance in the NPPF, NPSE and PPGN, it is likely that the level of noise will be within the NOEL, and it would in the very worst case not exceed the LOAEL.

7.127 The potential for cumulative impacts on the environment caused by noise and vibration from the converter station acting together with immissions from nearby committed and proposed third party projects has also been assessed. No cumulative impacts are expected to occur during construction. Furthermore, noise and vibration immissions from the operational converter station are not expected to impact new sensitive receptors introduced at those proposed development sites.

7.128 Mitigation for noise has been incorporated into the design of the site including the locations of plant and putting the SGTs in enclosures. Therefore provided the final plant specifications are equally or less noise generating than those provided in this assessment and that any changes to the layout plans do not influence the noise predictions, no further mitigation measures for operational noise should be required. A planning condition requesting details of plant to be included in the design and noise mitigation measures to be implemented would ensure that suitable controls are incorporated into the final plant selection and design.

7.129 In summary, there is the potential for low adverse impacts to occur due to noise during the construction and operation of the development. Construction noise will be controlled using best practicable means and operational noise will be controlled by ensuring the plant used complies to the specifications in this report, as provided in Appendix 7.1. The effects due to construction vibration are negligible.
References


8 Hydrology and Flood Risk

Introduction

8.1 This chapter appraises the likelihood of impacts on the hydrological environment and flood risk from the proposed HVDC converter station development near Exeter Airport. This chapter draws on relevant topic guidance and consultation to inform the appraisal and sets out the proposed measures to mitigate any potential adverse impacts.

8.2 This chapter takes into account the existing hydrological state and potential for surface water contamination. Whilst the focus of the chapter is on the site of the proposed converter station, consideration has been given to the possible temporary lay down area to the immediate west.

8.3 This ER chapter will:

- Present the existing environmental baseline condition evaluated from desk studies, dedicated surveys and consultation;
- Present the potential environmental impacts on local hydrology and flood risk arising from the development, based on the information gathered and the analysis and assessments undertaken to date;
- Identify any assumptions and limitations encountered in compiling the environmental information; and
- Highlight any necessary mitigation measures which could prevent, minimise, reduce or offset the possible environmental impacts identified.

8.4 The potential impacts considered in this chapter include those on hydrology and surface water resources that form part of the onshore physical environment. Impacts on hydrogeology and groundwater are considered in Chapter 9: Geology, Hydrogeology, Ground Conditions and Contamination. The following types of impacts are assessed in this chapter:

- Increase in flood risk;
- Surface water resources quality and quantity; and
- Blockage and/or damage to field drainage infrastructure.

Assessment Methodology

Policy and Guidance

8.5 An outline of the relevant European and National planning policy, legislation, regional plans specific to hydrology and flood risk are provided below.
National Planning Policy

8.6 The National Planning Policy Framework (NPPF) is a material consideration in determining planning applications. Paragraphs 99 to 108 of the NPPF outline the development requirements in terms of flood risk, water quality and resources and the impact of climate change, stipulating that a site specific Flood Risk Assessment (FRA) is required for all proposals for new development in Flood Zones 2 and 3 and for any proposal for developments on 1 ha or greater in Flood Zone 1.

8.7 On 6th March 2014 the Department for Communities and Local Government (DCLG) launched Planning Practice Guidance ID7 as a web-based resource. The Planning Practice Guidance ID7 (DCLG, 2014) for Flood Risk and Coastal Change provides additional guidance for the implementation of the NPPF in relation to development and flood risk.

Legislation

8.8 The list below sets out the main legislative drivers for managing risks to human health and the environment from hydrology and flood risk:

- Environmental Permitting (England and Wales) Regulations (2010) as amended;
- European legislation: Water framework directive;
- Flood and Water Management Act 2010;
- Land Drainage Act 1991;
- Water Resources Act 1991; and

8.9 The Flood and Water Management Act 2010 implements the recommendations from the Sir Michel Pitt's Review of the floods in 2007 and places a series of responsibilities on councils. The main aim of the Act is to improve flood risk management.

8.10 The Act introduced a ‘Lead Local Flood Authority’ (LLFA) with a ‘lead’ role in managing flood risk from surface water, groundwater and ordinary watercourses. The LLFA jurisdictional area for this project is DCC. The LLFA works closely with partners involved in flood and water management, namely the Environment Agency (EA) and Drainage Boards.

Guidance

8.11 The assessment also has regard to the following relevant guidance:

- National Planning Policy Statement Policy 10: Meeting the challenge of climate change, flooding and coastal change.
• National SUDS working group, Interim Code of Practice for Sustainable Drainage Systems, 2004; and


Consultation

8.12 Information obtained for this report is from publicly available data for the EA, British Geological Survey (BGS), EDDC and DDC.

8.13 Environmental data requests have been submitted to DCC and the EA responses to which are pending.

8.14 Details of relevant individual consultee meetings, information requests and responses are presented in Table 8.1 below.

Table 8.1 - Consultation Undertaken to Date for Hydrology and Flood Risk

<table>
<thead>
<tr>
<th>Date</th>
<th>Issues raised</th>
<th>How/where addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>13th May 2016</td>
<td>Environment Agency (Email) RPS requested environmental information, records and information pertaining to flood risk, surface water, water abstraction, private water supplies within a 1 km radius from the converter station.</td>
<td>No action required. Data incorporated into report where appropriate.</td>
</tr>
<tr>
<td>13th May 2016</td>
<td>Devon County Council (Email) RPS requested environmental information, records and information pertaining to flood risk, surface water, water abstraction, private water supplies within a 1 km radius from the converter station.</td>
<td>No action required. Data incorporated into report where appropriate.</td>
</tr>
<tr>
<td>3rd June 2016</td>
<td>Devon Country Council (Meeting) To introduce the scheme cable route corridors and converter station location. Discuss any concerns, guidance DCC might have.</td>
<td>No action required. Data incorporated into report where appropriate.</td>
</tr>
</tbody>
</table>
Date | Issues raised | How/where addressed
--- | --- | ---
16th September 2016 | Environment Agency Water Framework Directive (WFD) status utilised to determine sensitivity of watercourses | Data incorporated into report where appropriate and summarised below. WFD classifications take account of status updates (Table 8.5). The assessment for impacts on water quality has been based on the scale, duration and season of proposed works.

### Methodology

#### Study Area

8.15 The proposed application site is located at National Grid Reference SY 0178 9336, approximately 950 m to the east of Exeter Airport, occupying a relatively flat lying rectangular parcel of agricultural land 5.09 hectares (ha) in area.

8.16 Ordnance Survey (OS) contour mapping shows that the proposed development is located within elevations between 45 m above ordnance datum (AOD) and 35 m AOD.

8.17 The study area over which data is presented for the specific impact assessment contained in this chapter is set out below.

8.18 A 500 m search radius from the application site for data collection was selected primarily to allow for variance in final location, alignments and to identify any existing assets or infrastructure that might affect or be affected by the proposed development (see Figure 8.1: Study Area). A 500 m radius is appropriate for data collection taking into account the nature of the development and likely zone of influence on hydrological receptors. Given the landscape surrounding the development and ongoing anthropogenic activities it will be difficult to ascertain the exact source of any impacts on water quality beyond 500 m.

#### Data Sources

8.19 General information regarding the site setting and baseline conditions of the area has been obtained from the following:

- British Geological Survey (BGS), 1:625,000 scale surface geology mapping (online);
- BGS borehole scan records (online);
- BGS Geoindex Onshore (online);
- Devon County Council, Strategic Flood Risk Assessment (SFRA) (2013);
- East Devon District Council, Strategic Flood Risk Assessment (SFRA) (2008);
- Envirocheck Report, 2016 REF 87562931_1_1;
Key Parameters for Assessment

8.20 The proposed development design envelope provided within Chapter 2 represents the maximum parameters for assessment and as such has the potential to result in the greatest impacts upon hydrology and flood risk. (Table 8.2). This method provides a robust assessment of ‘worst case’ impacts on the hydrological environment due to the development requirements.

8.21 As the selection represents a ‘worst-case’ development requirement, effects of greater impact on the hydrological environment adverse significance are unlikely to arise.

8.22 For the purpose of this ER, flood risk is defined as the permanent removal or increase in low permeability surfacing leading to an alteration in pre-development surface water run-off rates or a derogation of floodplain storage. ‘Temporary’ flood risk is the temporary removal or alteration in permeable surfacing leading to a temporary increase in surface water run-off or derogation of floodplain storage (for example during construction).
### Table 8.2 - Design Envelope Scenario Considered for Impacts on Hydrology and Flood Risk

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Direct / Indirect</th>
<th>Maximum Adverse Scenario</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The impact of construction may affect flood risk</td>
<td>Direct</td>
<td>Increase in less permeable area of 2.05 ha increasing the rate of runoff. Converter dimensions as described in Chapter 2: Project Description.</td>
<td>For assessment purposes, the maximum dimensions of the converter station would result in the largest possible area of disturbance and flood storage and therefore, the greatest potential impact on flood risk due to installation works in flood risk areas.</td>
</tr>
<tr>
<td>The impact of construction may affect surface water resources.</td>
<td>Direct</td>
<td>Large vehicle movements may increase soil erosion increasing the suspended content within the surface water resources. Contamination via run-off from works as a result of spillages at converter station. Limited construction time as described in Chapter 2: Project Description.</td>
<td>For assessment purposes, the maximum dimensions of the converter station would result in the largest possible area of disturbance and flood storage and therefore, the greatest potential impact on flood risk due to installation works in flood risk areas.</td>
</tr>
<tr>
<td>The impact of construction may affect land drainage.</td>
<td>Direct</td>
<td>Construction phase may disrupt field drains. Converter station dimensions as described in Chapter 2: Project Description: All field drains disrupted within the converter station stage would be re-established to pre development state where appropriate.</td>
<td>Removal or temporary blockage of existing drainage pipeline infrastructure. A loss of the drainage network would lead to the backing up of gullies and surface water systems leading to potential surcharging and flood risk.</td>
</tr>
</tbody>
</table>
### Assessment Criteria and Impact Assessment Methodology

8.23 The baseline characterisation set out above enables the identification of the nature of potential impacts. The assessment considers the potential impacts to environmental receptors and the pathways by which the receptors may be affected. The following terms have the following meanings in this section.

- **Source**: potential contaminant sources, ground/channel disturbance;
- **Pathway**: the mechanism by which the source may affect a receptor; and
- **Receptor**: identified features that may be affected, based on the sensitivity of the site.

8.24 This includes consideration of the probability of harm occurring, taking into account potential sources of contamination and receptors that may be affected by such contamination.

8.25 The potential impacts likely to occur due to the developments has been determined by consideration of the sensitivity of the key attributes of the hydrology and flood risk that may be affected and the magnitude of the predicted impacts.

#### Determining the sensitivity of the receptor

8.26 The sensitivity or value of a hydrological receptor or attribute is largely determined by its quality, rarity and scale.
8.27 The determination of value or sensitivity takes into account the scale at which the attribute is important. This can be defined as being at a local level (application site), district level (Within the East Devon District), County level (Devon), regional level (South West of England), national level (United Kingdom) or international level (Europe).

8.28 The definitions set out in Table 8.3 below have been followed in the consideration of sensitivity for this project. This table takes into account guidance provided in Table 2.1 A4.3 of the Design Manual for Roads and Bridges (DMRB) (Highways Agency et al., 2009).

Table 8.3 - Definition of Terms Relating to the Sensitivity of Hydrological Receptors

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Definition</th>
</tr>
</thead>
</table>
| Negligible  | Receptor is of negligible value with no contribution to local, regional or national economy. Receptor is not vulnerable to impacts that may arise from the project and/or has high recoverability.  
Flood risk: Area outside flood plain or flood plain with very low probability of flooding industrial properties. |
| Low         | Receptor is of low value with little contribution to local, regional or national economy. Receptor is not generally vulnerable to impacts that may arise from the project and/or has high recoverability.  
Flood risk: Flood plain with limited constraints and a low probability of flooding of residential and industrial properties. |
| Medium      | Receptor is of minor value with small levels of contribution to local, regional or national economy. Receptor is somewhat vulnerable to impacts that may arise from the project and has moderate to high levels of recoverability.  
Flood risk: Flood plain with limited constraints and a low probability of flooding of residential and industrial properties. |
| High        | Receptor is of moderate value with reasonable contribution to local, regional or national economy. Receptor is generally vulnerable to impacts that may arise from the project and recoverability is slow and/or costly.  
Flood risk: Flood plain or defence protecting between one and one hundred residential properties or industrial premises from flooding. |
| Very High   | Receptor is high value or critical importance to local, regional or national economy. Receptor is highly vulnerable to impacts that may arise from the project and recoverability is long term or not possible.  
Flood risk: Flood plain or defence protecting more than one hundred residential properties from flooding. |

8.29 The EA, within the consultation response (16th September 2016), note that “it is not appropriate to classify the sensitivity of a waterbody to development based on its current Water Framework Directive (WFD) classification. Classifying rivers of lower environmental class as ‘less sensitive’ implies that they are more tolerant of development impacts and we [EA] have lesser ambition to improve them, which is misleading. All lower status waterbodies have objectives to improve with most aiming to achieve good status by 2027.”
8.30 It is acknowledged that, all waterbodies are sensitive to harm from development and to avoid potential for such unintended interpretations of the assessment the WFD classification has been removed from Table 8.3.

8.31 Current surface water resource status is defined based on a WFD classification, presented in Table 8.5 for those within the Study Area.

**Magnitude of Impacts**

8.32 The magnitude of any predicted impact is dependent on its size, duration, timing (e.g. seasonality) and frequency (permanent, seasonal etc.). A qualitative appraisal of the likely magnitude of the predicted impact is provided within this assessment, taking into account the measures proposed to be adopted as part of the development to control such impacts. The magnitude of the predicted impact has been described using the criteria outlined in Table 9.4 below. This table takes into account guidance provided in Table 2.1, A4.4 of DMRB (Highways Agency *et al.*, 2009) and professional judgement.

**Table 8.4 - Definition of Terms Relating to the Magnitude of an Impact upon Hydrology and Flood Risk**

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change</td>
<td>No change from baseline conditions.</td>
</tr>
<tr>
<td>Negligible</td>
<td>Very slight change from baseline condition. Physical extent of impact is negligible and of short term duration (i.e., less than 2 years).</td>
</tr>
<tr>
<td>Low</td>
<td>Minor shift away from baseline, leading to a reduction in level of activity that may be undertaken. Impact is of limited temporal or physical extent and of short term duration (i.e., less than 2 years).</td>
</tr>
<tr>
<td>Medium</td>
<td>Loss or alteration to significant portions of key components of current activity. Impact is of moderate temporal or physical extent and of medium term duration (i.e., less than 20 years).</td>
</tr>
<tr>
<td>High</td>
<td>Total loss of ability to carry on activities. Impact is of extended temporal or physical extent and of long term duration (i.e., approximately 50 years duration).</td>
</tr>
</tbody>
</table>

**Limitations of the Assessment**

8.33 The assessment is primarily based on publicly available data obtained from the Environment Agency (EA), DCC and commercial data supply companies, as well as additional information supplied from stakeholders during the scoping and consultation stages.

8.34 However the assessment is limited by a lack of:

- Flow data for watercourses and drainage channels;
- Water quality data for specific locations; and
8.35 Overall a moderate to high level of certainty has been applied to the study. Therefore there are no data limitations that would affect the conclusions of this assessment.

**Risk Assessment**

**Baseline Conditions**

8.36 Baseline data sets have been collated to inform the assessment of the potential environmental risks for the proposed converter station. Current site conditions were ascertained through a desk based assessment utilising publicly available data including OS mapping, aerial photography and utility plans. This provided an insight into surface water features and the existing land use of the hydrological features within the immediate vicinity of the proposed development.

**Characterisation of the Baseline Environment**

8.37 The proposed converter station site lies within the District of East Devon. The majority of the District is characterised by a rural agricultural inland with small settlements and villages with a catchment covering approximately 720 km² encapsulating the River Otter, River Sid, River Clyst and River Axe, EA designated main rivers, along with associated designated ordinary tributary networks.

8.38 The East Devon Catchment Flood Management Plan (CFMP) (EA, 2012) indicates that the EA has a rolling programme of flood defence reviews with a policy to protect properties, acknowledging that there would still be at risk from more extreme events, driven by climate change as land use and management changes.

8.39 The converter station is situated within the River Clyst hydrological catchment, which is classified as a main river maintained by the EA. Responsibility for ordinary watercourses which feed the Clyst fall under the jurisdiction of DCC acting as the Lead Local Flood Authority (LLFA) under the Water and Flood Management Act 2010 and Land Drainage Act 1991.

8.40 The topography within the application site is relatively level sloping down approximately 5 m from the south east corner to the northern boundary.

8.41 Further descriptions of the key hydrological and flood risk characteristics within the study area of the converter station are set out below.

**Flood Risks and Flood Defences**

8.42 All potential sources of flooding for the proposed development have been assessed in detail within the associated FRA (Appendix 8.1) and summarised below.

**Fluvial and Tidal Flooding**

8.43 The EA Flood Map for Planners indicates that the Site is located within Flood Zone 1 defined as having a less than a 0.1 per cent (1 in 1,000) chance of flooding occurring each year.

8.44 The risk of Flooding from River and Sea map which takes into account flood defences indicates that the Site is at very low risk of fluvial and tidal flooding.
Surface Water Flood Risk

8.45 The site is situated within an area of relatively flat topography. The EA Surface Water Flood Risk Map (Accessed June 2016) indicates that the majority of the converter site is located within an area defined as low risk. Small localised areas (possibly along surface water drains) are in area defined as medium to high risk.

8.46 Due to the relatively flat topography and agricultural nature of the area surrounding the development, the risk of flooding from surface water is defined as low.

Flooding Due to Rising Groundwater

8.47 BGS data (1:50,000) shows that the site is directly underlain by Aylesbeare Mudstone Group. No superficial deposits are present, however the geological maps identify several small areas of Made Ground in the local area including a small area on the site close to the site’s western boundary and also, in the area of the proposed temporary compound.

8.48 Aylesbeare Mudstone Group comprises reddish-brown silty mudstone and clayey siltstone with local occurrences of clayey fine-grained sandstone. In the Exeter area, the mudstone is approximately 400 metres (m) in thickness and is typically underlain by the Exmouth Mudstone and Sandstone Formation.

8.49 The underlying bedrock is classified as a Secondary B aquifer, which comprise predominantly low permeability layers which may store and yield limited amounts of groundwater from localised features such as fissures and thin permeable horizons. Aylesbeare Mudstone Group is also classified as a Non-Aquifer by the Environment Agency’s Groundwater Vulnerability dataset, which indicates where groundwater resources may be vulnerable to activities carried out on the surface land.

8.50 The EA and DCC SFRA indicate that no groundwater flooding incidents have occurred within the development area.

8.51 In addition, the Landmark Envirocheck report shows that the site is not in an area that has the potential to be flooded from groundwater.

Flooding From Infrastructure/Sewer Failure

8.52 As the site is currently agricultural land, it is assumed that no water infrastructure/sewers will be present within the site.

8.53 It is assumed that local sewer systems will have been designed to industry standards (e.g. Sewers for Adoption). The most common causes of flooding from sewers are inadequate flow capacity, blockages, pumping station failures, burst water mains, water inflow from rivers or the sea, tide locking, siltation, fats/greases, and sewer collapse. Should any of these events occur there is a risk of flooding by surcharge where the flood is in excess of the sewer capacity (usually 1 in 30 year event or greater).

8.54 Under the DG 5 register requirements, all water companies are obliged to keep a record of properties that have been affected by sewer flooding. The EDDC and DCC SFRA,
includes DG5 register information, indicates that the Site has not been affected by flooding from artificial sources.

8.55 Taking into account the above and absence of any historical sewer flooding the overall risk of flooding via artificial drainage system to the Site has been assessed to be low.

Reservoir Failure Assessment

8.56 EA mapping shows that the site is not at risk of reservoir flooding.

Historical Flood Events

8.57 DCC and EDDC SFRAs indicate that no historic flood risk has occurred within the site area.

Current Flood Risk

8.58 Based on the above, the converter station site has been determined not to be at flood risk.

Surface Water Resources

Surface Watercourses

8.59 A number of unnamed streams are present within the 500 m study area of the application site boundary. These unnamed watercourses are tributaries of the River Clyst, Otter and Aylesbeare Stream. The aforementioned catchments fall within the East Devon District.

8.60 There are several ponds and ditches in the wider area, with the closest pond being approximately 85 m to the east. The ponds are fed by a series of field drains and irrigation channels, which also convey surface water runoff from the site. During site reconnaissance access to drains and channels bounding the site was restricted by overgrown vegetation.

8.61 The closest unnamed watercourse flows in a southwards direction approximately 300 m to the east of the application area and is a tributary of Aylesbeare Stream.

Surface Water Quality

8.62 The South West River Basin District River Basin Management Plan (2009) and the EA catchment data explorer (accessed June 2016) provides the most current WFD Overall Status classifications for a number of watercourses within the study area of the converter station. Table 8.6 below lists the water body and associated Current and Objective WFD classification grade.

Table 8.5 - WFD Water Quality Data.

<table>
<thead>
<tr>
<th>Waterbody Name</th>
<th>Current Overall Status (2015)</th>
<th>Objective Status (2027)</th>
<th>Failing elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower River Otter</td>
<td>Moderate.</td>
<td>Good</td>
<td>Macrophytes &amp; Phytophentos, Phosphate</td>
</tr>
<tr>
<td>Upper Clyst</td>
<td>Moderate.</td>
<td>Good</td>
<td>Fish</td>
</tr>
<tr>
<td>Waterbody Name</td>
<td>Current Overall Status (2015)</td>
<td>Objective Status (2027)</td>
<td>Failing elements</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------</td>
<td>-------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Aylesbeare Stream</td>
<td>Poor.</td>
<td>Good</td>
<td>Fish</td>
</tr>
</tbody>
</table>

8.63 In summary, the WFD records show that the watercourses within the study area have a varying WFD status of Moderate to Poor. However, all lower status waterbodies have objectives to improve and all aim to achieve good status by 2027.

8.64 A full description of the WFD classification process and associated definitions are provided in Appendix 8.2.

*Surface Water Abstraction*

8.65 The Landmark Envirocheck report (2016) indicates that there are no abstractions within 500 m of the site area. The closest is 1,968 m from the development site with a daily rate of 7 m³.

*Surface Water Drainage*

8.66 A visual inspection of the site and topographical data suggests that surface water is conveyed from south to the northwest corner of the site, from where water either enters small irrigation and/or field drainage channels. Water flows in a general east and northerly directions via a series of drainage channels. Excess water during extreme weather events over tops the northern boundary channel and enters the open fields immediately north.

*Discharge Consents*

8.67 The closest discharge consent to the site is located approximately 300 m to the west and relates to the discharge of final/treated effluent to a drain leading to the River Clyst.

*Pollution Incidents*

8.68 A number of pollution incidents were reported in the mid-1990s, however none of incidents directly related to the site. The closest reported pollution incident to the site occurred at a farm approximately 190 m north east and involved the discharge of animal waste into a stream as a result of poor operational practice. The incident was classified as ‘minor’.

*Flood Risk Assessment*

8.69 An FRA has been undertaken for the proposed development in accordance with the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance ID 7. The proposed development is defined as ‘Essential infrastructure’ in Table 2 of the Technical Guidance to the NPPF and is appropriate for the location.

8.70 The proposed development will increase the amount of low permeability cover and surface run-off to local watercourses.

8.71 Prior to the construction of the proposed development an appropriate discharge rate from the site will need to be agreed with the EA, local council and local drainage board which will mimic the pre-development site characteristics.
8.72 EA flood zone maps are the first stage in identifying the risk of flooding for a particular location. The EA flood extent maps do not take into account the impact of local flood defences and climate change on flooding. They also do not provide information on flood depth, speed or volume of flow. They do not show flooding from other sources, such as groundwater, direct runoff from fields, or overflowing sewers.

8.73 Figure 8.1 shows the EA flood Zone Risk Map for the converter station site. The map indicates that the converter station is within Flood Zone 1 (FZ1).

8.74 Calculations extracted from the FRA (Appendix 8.1) indicate that the overall attenuation requirement for the 2.05 ha increase in low permeable surfacing is 1,334 m$^3$ to be discharged at the current pre-development ‘Greenfield’ (1 in 1 year) run-off rate of 14.70 l.s$^{-1}$. The attenuation will comprise a mix of techniques in line with SuDS guidance, including a network of gullies, linear drainage channels (as required) and areas of permeable construction discharging water into the onsite gravity, surface water network. The surface water network will discharge at strategic location along the proposed attenuation ditch located along the northern boundary of the site.

8.75 A preliminary design undertaken in MicroDrainage indicates an attenuation ditch with straight sides and a flat base, with an area of 1000 m$^2$, with a constant depth of 1.4 m will provide sufficient storage for the 1 in 100 plus 20% climate change return period. It is envisaged that the ditch could be constructed utilising a gabion wall system with reno mattresses at the base. Using these systems will encourage biodiversity. Detailed design should ensure that the gabion baskets are offset a minimum of 150 mm transversely to provide steps as a safety measure.

8.76 The site is located within a flat lying and primarily agricultural landscape, indicating that the potential surface water flood risk to the site is low.

8.77 Land drainage will be restored to its existing condition, where practicable. The location and method of land drainage is illustrated in Appendix 3 of the associated FRA.

**Assessment of Construction Impacts**

8.78 The potential impacts of the construction of the proposed development has been assessed on hydrology and flood risk potential within the defined study area. The potential for impacts arising from the construction of the converter station are listed in Table 8.2 along with the Design Envelope Parameters against which each potential construction phase impact has been assessed.

8.79 During the construction phase there are negligible impacts anticipated on flooding from fluvial/tidal sources or infrastructure failure. The magnitude of impact of the construction phase on surface water and ground water flooding has been assessed below.

**Flood Risk**

8.80 Construction of the proposed converter station requires levelling the site and the excavation of the foundations for the building and equipment. A temporary low permeable construction compound will also be needed to house the heavy vehicles and construction workers.
The excavation of the foundations and levelling of the site is likely to change the natural hydrological characteristics of the site potentially increasing the surface water flood risk.

The flood risk also has the potential to increase due to the low permeable construction area which is likely to temporarily increase surface runoff to the surrounding land and drainage networks.

As highlighted in Chapter 9: Geology and hydrogeology the construction phase of the development is unlikely to disturb the underlying Aylesbeare Mudstone aquifer. Therefore the risk of increasing groundwater flooding due to construction has been assessed as negligible.

The proposed development area has been assessed as not being directly at risk of flooding and is presently a ‘greenfield’ with no hard surfacing. A worst case 100% increase in low permeable surfacing as a consequence of the development has been assumed, which could directly impact flood risk on adjoining agricultural land due to increase in surface water runoff rates. Land adjoining the site has been assessed to be at low vulnerability, high recoverability (see Table 8.4).

The construction methodologies will ensure the risk of flooding is not increased during development through the use of surface water run-off management strategies. Recommended mitigation measures are provided below and included within the Draft Code of Construction Practice (CoCP) (Chapter 11). The proposed engineering and drainage methods are to be agreed with the regulators for inclusion within the consenting process.

Therefore from the above it has been concluded that the potential impact of the construction phase on the application site in relation to flood risk is low.

Surface Water Resources

The potential for significant widespread impacts on surrounding water resources is dependent on the scale, duration and season during which the effect takes place. Based on the local importance, general vulnerability, and slow recovery of water resources within the Study Area, the sensitivity has been determined to be medium to high.

Activities on site during construction could lead to an increase in turbid run-off and spillages/leaks of fuel, oil etc. that could affect nearby watercourses through surface water runoff. However, the construction process would include mitigation measures to intercept run-off and ensure that discharges from the site are controlled in quality and volume. This may include the use of settling tanks or ponds to remove sediment, temporary interceptors and a hydraulic brake. The potential for contamination to occur would be reduced by implementing the pollution control mitigation measures as set out above.

With the introduction of the proposed mitigation measures outlined within this chapter, the impact of the construction phase on surface watercourse has been assessed as low.

Disturbance of Land Drainage

Construction works may lead to the severing or blockage of field drains, which could lead to flooding of affected fields. Based on the site setting, these drains are considered to be of
moderate vulnerability, moderate to high recoverability and minor value. Therefore the potential unmitigated impacts on land drainage during the construction phase are considered to be high.

8.91 However, the impacts of the construction phase on land drainage will be low as land drains will be restored to pre-construction condition where practicable.

**Assessment of Operational Impacts**

8.92 The impacts of the operation and maintenance of the proposed development on hydrology and flood risk within the converter station study area has been assessed. The environmental impacts arising from the operation and maintenance of the converter station are listed in Table 8.2 along with the design envelope parameters against which each potential operation and maintenance phase impact has been assessed.

**Flood Risk**

8.93 The site is located within NPPF and Technical Guidance to the NPPF Flood Zone 1 'low probability', defined by the EA as land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%).

8.94 Following construction and during the operation phase the proposed development will result in an increase in low-permeability surface area which has the potential to increase the surface water runoff of the site. As described above, an FRA has been undertaken for the proposed development (Appendix 8.1) which concludes that incorporated SuDS has been designed to attenuate the existing greenfield runoff rates. Off-site surface water flows are restricted to pre-development rates, including appropriate contamination mitigation measures. These measures are listed below and have been included in the draft CoCP (Chapter 11).

8.95 With the incorporation of the proposed mitigation measures outlined within this chapter, the impact of operation on flood risk is assessed as low.

**Surface Water Quality**

8.96 Routine maintenance of the converter station may require the use of oils and chemicals. There is the potential for spillages to occur which could cause localised soil and possibly surface water runoff contamination. This in turn has the potential to contaminate surrounding surface watercourses. The impact would be reduced by following good practice in the storage, use and disposal of oils and chemicals, and by following the recommended mitigation measures (Table 8.6) in cleaning surface water captured on site before release.

8.97 There is also the potential for leakages of oil to occur from the transformers, however the drainage design of the converter station will include oil interceptor tanks to ensure that any oil lost from a transformer is prevented from entering the storm water discharge system.

8.98 The following of good practice in storage and disposal of oils / chemicals and the incorporation of the proposed mitigation measures mean that the impact of the operation phase on surface water quality will be low.
Cumulative Impacts

8.99 The developments identified for consideration are identified on Figure 2.9 and Appendix 2.2.

8.100 The schemes listed in Table 8.6 and illustrated on Figure 2.9 have been considered in the cumulative assessment for Hydrology and Flood Risk. The study area for cumulative assessment for Hydrology and Flood Risk is 1 km from the proposed development based on the potential impacts.

8.101 Where the impacts of these schemes have the potential for cumulative effects on water quality and flood risk, the potential cumulative impact column of the table identifies these and a description is given below the table.

Table 8.6 - Cumulative schemes within 1km.

<table>
<thead>
<tr>
<th>Address</th>
<th>Ref Number</th>
<th>Validation Date</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>McBains Business Units Road</td>
<td>16/1578/</td>
<td>03-Oct-16</td>
<td>Proposed Industrial unit, roadways, parking and</td>
<td>Approx. 0.2 km to the west of the converter station</td>
</tr>
<tr>
<td>Past Exeter Airport Clyst</td>
<td>MFUL</td>
<td></td>
<td>infrastructure</td>
<td>No cumulative effects on water resources and flood risk receptors are</td>
</tr>
<tr>
<td>Honiton</td>
<td></td>
<td></td>
<td></td>
<td>likely because there is no pathway from the proposed development</td>
</tr>
<tr>
<td>Exeter EX5 2BA</td>
<td></td>
<td></td>
<td></td>
<td>to either the cable installation or the onshore HVDC converter / HVAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>substation.</td>
</tr>
<tr>
<td>Address</td>
<td>Ref Number</td>
<td>Validation Date</td>
<td>Description</td>
<td>Comments</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------</td>
<td>-----------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cranbrook Expansion Site South Lane To Treasbeare Farm Clyst Honiton</td>
<td>15/0046/ MOUT</td>
<td>10-Mar-15</td>
<td>The expansion of Cranbrook comprising up to an additional 1,550 residential dwellings, 40,000 sq m of employment (B1, B2, B8), one 2-form entry primary school, a local centre comprising of up to 1,000sq m of A1 uses plus A2, A3, A4, A5 uses and up to 1,250sq m B1 business use. Sports and recreation facilities including children’s play, green infrastructure (including open space), community uses (including non-residential institutions), assembly and leisure. Access from former A30, landscaping, allotments, engineering (including ground modelling and drainage) works, demolition, associated infrastructure and car parking for all uses. All matters reserved except access.</td>
<td>Approx. 0.9 km to the north of the converter station</td>
</tr>
</tbody>
</table>

**Proposed Mitigation Measures**

8.102 Potential impacts to the water environment will be avoided where possible through careful consideration of the drainage design and construction techniques of the converter station.
Furthermore, as part of the development design process, a number of designed-in mitigation measures have been proposed to reduce the potential for impacts on hydrology and flood risk. Table 8.7. These measures are considered standard industry practice for this type of development. In addition, the EA and LLFA will be consulted through the works planning process to ensure all appropriate permits and consents are in place.

**Table 8.7 – Designed-in Mitigation Measures Adopted As Part of the Proposal with Respect to Hydrology and Flood Risk.**

<table>
<thead>
<tr>
<th>Designed-in Mitigation Measures Adopted As Part of the Proposal</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Surface Water Management Strategy</strong></td>
<td></td>
</tr>
<tr>
<td>The proposed development would result in the construction of low permeable surfacing, increasing the rate of surface water run-off from the site. A surface water management plan will be implemented to ensure the existing run-off rates to the surrounding water environment are maintained at pre development rates. The detailed design of the surface water management strategy would be based on a series of infiltration/soakaway tests carried out on site and the attenuation volumes outlined in the FRA (totalling 1,313 m³). The tests would be undertaken prior to construction and in accordance with the BRE Digest 365 Guidelines. The strategy would ensure that the mean annual run-off rate is maintained at the current greenfield run-off rate. Measures to mitigate against water pollution would also apply and would include measures as set below.</td>
<td>To address the NPPF, EA and WSCC surface water run-off requirements.</td>
</tr>
<tr>
<td><strong>Best Practice Measures</strong></td>
<td></td>
</tr>
<tr>
<td>All construction work would be undertaken in accordance with guidance and the measures outlined in the draft Code of Construction Practice (Chapter 10) (which will in turn inform the detailed Construction Environmental Management Plan (CEMP) to be produced prior to construction). Current guidance includes: Environment Agency, Pollution Prevention Guidance Note 6 (PPG6): Pollution Prevention Guidelines – Working at Construction and Demolition Sites; Environment Agency, Pollution Prevention Guidance Note 5 (PPG5):– Working in, near or liable to affect watercourses; Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C650); CIRIA – SuDS Manual; Prevent surface water being affected during earthwork operations. No discharge to surface watercourses will occur without permission from the EA (SuDS Manual); Wheel washers and dust suppression measures to be</td>
<td>To accord with guidance and best practice guidelines for constructional works.</td>
</tr>
<tr>
<td>Designed-in Mitigation Measures Adopted As Part of the Proposal</td>
<td>Justification</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>used as appropriate to prevent the migration of pollutants (SuDS Manual);</td>
<td></td>
</tr>
<tr>
<td>Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual); and</td>
<td></td>
</tr>
<tr>
<td>A construction method statement to be submitted for approval by the responsible authority (SuDS Manual).</td>
<td></td>
</tr>
</tbody>
</table>

**Pollution Prevention Measures**

Refuelling of machinery would be undertaken within designated areas where spillages can be easily contained. Machinery would be routinely checked to ensure it is in good working condition.

Any tanks and associated pipe work containing substances included in List 1 of the Groundwater Directive would be double skinned and be provided with intermediate leak detection equipment.

The following specific mitigation measures for the protection of surface water during construction activates would be implemented:

- Management of construction works to comply with the necessary standards and consent conditions as identified by the EA and LLFA (Devon County Council);
- A briefing for all staff highlighting the importance of water quality, the location of watercourses and pollution prevention included within the site induction;
- Areas with prevalent run-off to be identified and drainage actively managed, e.g. through bunding and/or temporary drainage;
- Areas at risk of spillage, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) to be bunded and carefully sited to minimise the risk of hazardous substances entering the drainage system or the local watercourses. Additionally the bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage. Bunds used to store fuel, oil etc. to have a 110% capacity of the volume of fuel, oil etc. to be stored;
- Disturbance to areas close to watercourses reduced to the minimum necessary for the work;
- Excavated material to be placed in such a way as to avoid any disturbance of areas near to the banks of watercourses and any spillage into the watercourses;
- Construction materials to be managed in such a way as to effectively minimise the risk posed to the aquatic environment;
- All plant machinery and vehicles to be maintained in a good condition to reduce the risk of fuel leaks;
- Drainage works to be constructed to relevant statutory guidance and approved via the Lead Local Flood Authority
### Designed-in Mitigation Measures Adopted As Part of the Proposal

<table>
<thead>
<tr>
<th>Maintenance</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultation with the EA to be ongoing throughout the construction period</td>
<td>To reduce the risk of surface water pollution based on guidance in e.g.</td>
</tr>
<tr>
<td>to promote best practice and to implement proposed mitigation measures.</td>
<td>Environment Agency, Planning Policy Guidance Note 22 (PPG22): Pollution</td>
</tr>
<tr>
<td></td>
<td>Prevention Guidelines – Dealing with Spills.</td>
</tr>
</tbody>
</table>

### Conclusion

8.103 The impacts on hydrology and flood risk for the proposed development has been assessed in line with the relevant NPPF and PPG ID7, as well as all other relevant legislation, guidance, planning policy and technical documentation.

8.104 The assessment has indicated that there will be no major impacts on surrounding surface watercourses or natural runoff characteristics to the surrounding areas arising from the proposed development following the implementation of the proposed mitigation measures.
References


Department for Environment, Food and Rural Affairs (Defra) (October 2006) Flood and Coastal Defence Appraisal Guidance FCDPAG4 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts;


Devon County Council (2013), Devon Strategic Flood Risk Assessment (SFRA);

Envirocheck Report, 2016 REF 87562931_1_1;


Environment Agency (2011a) PPG2 Above Ground Oil Storage Tanks. Environment Agency;

Environment Agency (2006) PPG3 Use and design of oil separators in surface water drainage systems, Environment Agency;

Environment Agency (2007a) PPG5 Works and Maintenance In or Near Water. Environment Agency;


Environment Agency (2011) PPG7 The safe operation of refuelling facilities, Environment Agency;


Environment Agency (2011) PPG26 Storage and handling of drums and intermediate bulk containers, Environment Agency;
Environment Agency Website (2016) (www.environment-agency.gov.uk);
Environment Agency (2009), River Basin management Plan, South West River Basin District.
Environment Agency Flood Hazard Mapping;
Forestry Commission (2004). Forest and Water Guidelines;
Institute of Geological Sciences (1977). Hydrogeological Map of England and Wales (Scale 1:250,000);
Landmark (2016) Envirocheck Report (87562931)
Met Office: Climate data (2012) (www.metoffice.gov.uk);
Ordnance Survey Explorer (2006) 1:50,000;
Ordnance Survey 1:10,000 Scale Electronic Data Mapping for assessment area;
The Planning Inspectorate’s Advice Note Nine: Rochdale Envelope, Version 2, April 2012;
Soil Survey of England and Wales (1983). Soils Map of England and Wales (Scale 1:250,000);
The Centre for Ecology and Hydrology (CEH) (2015, 2016) (www.ceh.ac.uk);
9 Geology, Hydrogeology, Ground Conditions and Contamination (including UXO)

Introduction

9.1 This chapter appraises the likelihood of impacts on the geological and hydrogeological resources underlying the site, taking into account the existing ground conditions and potential for contamination (including unexploded ordnance (UXO) contamination) from the proposed FAB Link HVDC converter station development near Exeter Airport. This chapter draws on relevant guidance and consultation to inform the appraisal and sets out the proposed measures to mitigate any potential adverse impacts.

9.2 Whilst the focus of the chapter is on the site of the proposed converter station, consideration has been given to the temporary lay down area to the immediate west.

Assessment Methodology

Policy and Relevant Guidance

National Planning Policy

9.3 The National Planning Policy Framework (NPPF) (DCLG, 2012) together with the National Planning Practice Guidance set out the government’s national planning policies and guidance for new development. With regard to contaminated land, the NPPF states that planning policies and decisions should ensure that the site is suitable for its new use taking account of ground conditions, including pollution arising from previous uses and proposed mitigation.

Legislation

9.4 The list below sets out the main legislative drivers for managing risks to human health and the environment from land contamination:

- Part IIA of the Environmental Protection Act (EPA) (1990);
- Environment Act (1995);
- Contaminated Land (England) Regulations (2006);
- Groundwater Regulations (2008), which transpose the EC Groundwater Directive 80/68/EC into UK law;
- Groundwater (England and Wales) Regulations (2009);
- Environmental Permitting (England and Wales) Regulations (2010) as amended; and
9.5 Under Part IIA of the EPA, sites are identified as ‘contaminated land’ if they are causing or if there is a significant possibility of causing significant harm to human health or significant pollution of controlled waters. ‘Controlled waters’ are defined in Section 104 of the Water Resources Act (1991) as including both inland freshwaters (e.g. lakes, ponds, rivers) and groundwaters (i.e. any waters contained in underground strata).

Guidance

9.6 The assessment also has regard to the following relevant guidance:

- Environmental Protection Act 1990: Part 2 A Contaminated Land Statutory Guidance (Defra, 2012);
- British Standards BS 10175 (2011) Investigation of Potentially Contaminated Sites;
- Contaminated Land Report 11 (CLR11) (Environment Agency, 2004); and

Consultation

9.7 No consultation with stakeholders or consultees has been undertaken in respect of geology, hydrogeology or ground conditions. An Envirocheck report was obtained for the site from Landmark (2016), which contains data from databases operated by the Environment Agency, British Geological Survey and East Devon District Council.

Methodology

9.8 The assessment of baseline conditions and contamination risks follows a 2 stage process (Phase 1 and 2). A Phase 1 assessment comprises a historical research element - a Desk Top Study (DTS) and a first-pass conceptual model of risk - a Preliminary Risk Assessment (PRA). The PRA is based on the Source-Pathway-Receptor principles (see below). Phase 2 would comprise Intrusive Investigations and an Interpretive Investigation Report (also incorporating the findings of the DTS and PRA). However, where risks are found to be low at Phase 1 (as is the case here), the second phase can be avoided.

9.9 The DTS and PRA are used to establish the site sensitivity, ground conditions (including ground stability issues) and potential contaminated land issues at the site and reflect the requirements of the relevant parts of the Model Procedures for the Management of Land Contamination (CLR11) and the National Planning Policy Framework (NPPF) mentioned above.

9.10 The DTS and PRA for the converter station site have included the following elements:

- The purchase of a ‘GroundSure’ report;
- Review of historical maps of the site and surrounding area to determine the likelihood of historical contamination to be present in soils and groundwater;
• Review of available information including geology, hydrogeology and hydrology to provide an understanding of the environmental setting of the site;

• Review of environmental databases to further characterise the environmental setting of the site, including the assessment of any nearby pollution incidents, environmental permitting, IPC sites and waste handling / disposal sites;

• Review of Environment Agency (EA) and the Local Authority (LA) records to identify if the site has been the subject to any reported pollution incidents;

• Review of local authority planning records for adjacent developments and associated technical reports to refine the understanding of ground conditions and associated geotechnical parameters; and

• A site walkover visit to identify and photograph any visual evidence of potential contaminant sources and identify key site features.

9.11 The assessment reported in this chapter has determined that the DTS and PRA are sufficient to characterise the risks of contamination on site and therefore a Phase 2 survey and report would be unnecessary.

9.12 As stated above, the methodology for the assessment of baseline conditions and contamination at the site follows the phased approach presented in CLR 11 (EA, 2004). The baseline characterisation of the site is used to develop a Conceptual Site Model (CSM), which identifies the existing ground conditions using the source-pathway-receptor pollutant linkage approach:

• Source: potential contaminant sources;

• Pathway: the mechanism by which the source may affect a receptor; and

• Receptor: identified features that may be affected, based on the sensitivity of the site.

9.13 The assessment considers the potential risk to environmental receptors and the pathways by which the receptors may be affected. This includes an evaluation of the probability of harm occurring, taking into account potential sources of contamination and receptors that may be affected by such contamination.

9.14 A separate assessment of risks posed by Unexploded Ordnance (UXO) has been carried out for the site which is reported as Appendix 9.1. The risks posed to humans during construction from undiscovered UXO are not discussed further in this chapter.

Limitations of the Assessment

9.15 It has not been necessary to undertake a site visit and ground truthing of the desk-based information has been made from photographs and observation notes taken by a member of the Environment Reporting team.
9.16 Given the historical and current uses across the majority of the site, there are not considered to be any widespread contamination sources. Therefore, there are no data limitations that would affect the conclusions of this assessment.

**Assessment of Construction Impacts**

**Baseline Conditions**

**Published Geological Information**

9.17 British Geological Survey (BGS) data (1:50,000) shows that the site is directly underlain by Aylesbeare Mudstone Group. No superficial deposits are present, however the geological maps identify several small areas of Made Ground in the local area including a small area on the site close to the site’s western boundary and also, in the area of the proposed temporary compound.

9.18 Aylesbeare Mudstone Group comprises reddish-brown silty mudstone and clayey siltstone with local occurrences of clayey fine-grained sandstone. In the Exeter area, the mudstone is approximately 400 metres (m) in thickness and is typically underlain by the Exmouth Mudstone and Sandstone Formation.

**Hydrogeology**

9.19 The underlying bedrock is classified as a Secondary B aquifer, which comprise predominantly low permeability layers which may store and yield limited amounts of groundwater from localised features such as fissures and thin permeable horizons.

9.20 Groundwater Source Protection Zones (SPZs) are defined by the Environment Agency around areas where groundwater is abstracted to provide potable water supplies. The SPZs are used to monitor the risk of contamination to groundwater from potentially polluting activities and the accidental release of pollutants. There are no SPZs within 2 kilometres (km) of the site.

**Groundwater Abstractions**

9.21 Environment Agency records show there are four licensed groundwater abstractions within 1 km of the site, all of which are used for general agricultural purposes. The closest of the abstractions is located approximately 270 m north east of the site.

**Discharge Consents**

9.22 The closest discharge consent to the site is located approximately 300 m to the west and relates to the discharge of final/treated effluent to a drain leading to the River Clyst.

**Site History**

9.23 Historical Ordnance Survey (OS) maps dating back from 1889 to 2016 have been reviewed as part of the assessment (available in Appendix 9.2).

9.24 Historical maps indicate that the site has predominantly been used for agriculture comprising a large single field with a pond close to the western boundary. There are other ponds in the vicinity of the site to the north, south and west. The southern boundary of the site is delineated by a road and a spring was shown on the northern boundary (1969 edition map only). From the 1991 map edition onwards, the pond on the site and those in the immediate vicinity are no longer shown.
They are likely to have been infilled and this corresponds with the Landmark map, which identifies these areas as “potentially infilled land (water)”. The BGS maps also show these areas to comprise “Made Ground”.

9.25 The area surrounding the site also comprises predominantly agricultural land. A depot (formerly the Devon River Authority Depot) is located approximately 80 m to the west and was first shown on the 1962 OS map edition, which identifies a number of unlabelled buildings in the east of the depot. By 1971, most of these buildings had been cleared and replaced by a smaller building in the eastern corner and a water tower. By 1991, the water tower had been cleared and the site was occupied by larger buildings in the east, centre and north west. These buildings are still shown on the 2016 map edition and are used as a depot by the Environment Agency and industrial units by a signage company.

9.26 Further industrial units and residential units are located approximately 180 m west. Higher Southwood Farm is located 200 m to the north east and the boundary of Exeter Airport is located approximately 300 m north west.

Radon

9.27 According to the Envirocheck Report (Landmark, 2016), the site is located in a lower probability radon area (classified on the basis that less than 1% of homes are above the radon Action Level of 200 becquerels per cubic metre (Bq m\(^{-3}\)) averaged over a year).

Waste Sites

9.28 There are no licensed operational waste management facilities within 1 km of the site. Environment Agency records identify a former waste transfer station was located approximately 215 m west of the site, however the licence was revoked in August 2010.

Pollution Incidents

9.29 A number of pollution incidents were reported in the mid-1990s, however none of incidents directly related to the site. The closest reported pollution incident to the site occurred at a farm approximately 190 m north east and involved the discharge of animal waste into a stream as a result of poor operational practice. The incident was classified as ‘minor’.

Designated Sites

9.30 There are no Sites of Special Scientific Interest (SSSI) or other ecological, geological or archaeological designations on the site or within the immediate vicinity. The site is located within a Nitrate Vulnerable Zone (NVZ), i.e. land which drains to and contributes to surface and groundwater that contains at least 50 milligrams per litre (mg/l) of nitrate.

Preliminary Environmental Risk Assessment

Preliminary Conceptual Site Model

9.31 A preliminary Conceptual Site Model (CSM) has been developed using the baseline information to identify the potential contaminant sources, pathways and receptors (i.e. potential pollutant linkages) on the site. The CSM is described below.
Source - On Site

9.32 The site has been used for agricultural purposes since at least the late 19th century and comprises a large open field. Historic maps identified ponds in the west of the site close to the site boundary, and on the proposed compound area which have been infilled (Appendix 9.2). The nature and source of the material used to infill the ponds is unknown and therefore, may contain elevated levels of contaminants.

Source - Off Site

9.33 The surrounding land use is predominantly agricultural with the main potential for contaminants to be located in and around farm buildings (for example, storage and maintenance of farm vehicles, fuel storage, pesticide stores, animal sheds and slurry stores). The closest farm is located approximately 200 m north east.

9.34 A depot is located approximately 80 m to the west (and adjacent to the proposed compound), which was formerly occupied by Devon Rivers Authority and now by the Environment Agency. There is no information available on the activities undertaken at the depot, however there is the potential for oils, chemicals and possibly fuel to have been stored/used. Similarly, oils and chemicals may also be stored/used in the industrial units further to the west. However, given the size and use of the industrial units the amounts of oils and chemicals are likely to be relatively small.

9.35 A number of infilled ponds are also located in the vicinity of the site and there is the potential for localised contamination as a result of the infill material.

Pathways

9.36 The direct ingestion and dermal contact pathways would be active across the site for construction workers. However, the pathways would be inactive for the future users of the site, where buildings and hardstanding cover are proposed.

9.37 There are no surface watercourses on the site that could act as a pathway. The underlying Aylesbeare Mudstone Group has a predominantly low permeability and the leaching of any potential contaminants would be limited.

Receptors

9.38 The receptors identified in the CSM are listed below:

- construction workers,
- future users; and
- Secondary B aquifer associated with the Aylesbeare Mudstone Group.

Preliminary Risk Assessment

9.39 The table below presents an assessment of the potential risks with respect to contaminated land issues and the receptor group based on the intended development of the site. The assessment
uses the CIRIA C552 criteria (Rudland et al., 2001) to define the level of risk based on the classification of probability and consequence of occurrence (available in Appendix 9.3).

**Table 9.1 Preliminary Risk Assessment**

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Probability of Exposure</th>
<th>Consequence of Exposure</th>
<th>Risk</th>
<th>Key Potential Contamination Linkages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction workers</td>
<td>Unlikely (Low likelihood in area of former pond)</td>
<td>Mild</td>
<td>Very low risk (low risk in area of former pond)</td>
<td>None identified. Minor risk from localised contamination associated with infilling of former ponds.</td>
</tr>
<tr>
<td>Future users</td>
<td>Unlikely</td>
<td>Minor</td>
<td>Very low risk</td>
<td>None identified.</td>
</tr>
<tr>
<td>Controlled Waters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary B Aquifer</td>
<td>Unlikely</td>
<td>Minor</td>
<td>Very low risk</td>
<td>None identified.</td>
</tr>
</tbody>
</table>

**Construction Impacts**

**Disturbance to the Secondary B Aquifer**

9.40 Construction of the proposed converter station requires levelling the site and the excavation of the foundations for the building and equipment. The Secondary B aquifer (in the form of the Aylesbeare Mudstone Group is unlikely to be impacted in terms of disturbance given that the aquifer is not an important groundwater resource and does not support any abstractions on site or in the immediate vicinity.

**Contamination of the Secondary B Aquifer**

9.41 The potential for significant widespread contamination on the site as a result of former land uses is low, therefore there is unlikely to be an impact in terms of mobilising existing contaminants during construction. Elevated levels of contaminants may be encountered in the vicinity of the infilled pond due to the unknown source and nature of the infill material. Geotechnical testing undertaken during detailed design will characterise ground conditions and identify if further soil analysis is required.

9.42 Localised contamination of the soil and possibly groundwater (where permeable layers of the Secondary B Aquifer are present) may occur during construction as a result of leaks or spills of fuels, oils and chemicals. The potential for contamination to occur will be reduced by implementing the pollution control mitigation measures as set out later in this section.

**Assessment of Operational Impacts**

9.43 Routine maintenance of the converter station is likely to require the use of oils and chemicals. There is the potential for spillages to occur which could cause localised soil and possibly groundwater contamination (where permeable layers of the Secondary B aquifer are present).
The impact will be reduced by following good practice in the storage, use and disposal of oils and chemicals, and by following the recommended mitigation measures below. There is also the potential for leakages of oil to occur from the transformers, however the drainage design of the converter station will include oil interceptor tanks to ensure that any oil lost from a transformer is prevented from entering the storm water discharge system.

**Cumulative Impacts**

9.44 The developments identified for consideration are identified on Figure 2.9 and Appendix 2.2.

9.45 Cumulative impacts on geology, hydrogeology, ground conditions and contamination are unlikely. The closest development (proposed industrial units, ref. 16/1578/MFUL) is likely to be underlain by the same Secondary B aquifer unit as the proposed converter station. However, the aquifer is not a sensitive groundwater resource and is unlikely to be affected by the construction or operation of the industrial unit development. The other developments are located at some distance from the proposed converter station site and are unlikely to result in a cumulative impact in terms of geology, hydrogeology, ground conditions and contamination. Those developments, which are for housing, will require large volumes of water during their occupation which will place an increased demand on water resources. In contrast, the operation of the converter station does not require large volumes of water and therefore, is unlikely to result in a cumulative impact.

**Proposed Mitigation Measures**

9.46 The following mitigation measures are proposed:

- Store oil in accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001.

- Implement measures to prevent and control the spillage of oil, chemicals and other potentially harmful liquids. For example, provide a designated storage area with impervious hardstanding and an oil interceptor; provide secondary containment system that can hold at least 110% of the oil volume stored; locate the storage area away from springs, wells or borehole and areas at risk of flooding.

- Refuel machinery in designated areas only.

- Undertake routine checks of machinery, tanks and pipework.

- Provide appropriate spill kits on the construction site and laydown areas and train staff in their use.

- The results of the Preliminary Risk Assessment and the desk study indicate that the risk of pollution linkages existing on the site is low to very low. Further information is not needed to clarify elements of potential pollution linkages and therefore, an intrusive investigation for contamination purposes is not considered necessary.
- Inform construction workers of the location of the infilled pond and the potential for localised contamination. Provide training on the olfactory and visual signs to be aware of and the procedure to follow if contamination is suspected.

- The UXO risk assessment report at Appendix 9.1 should be referred to for specific advice regarding mitigation of risks to humans during construction of the converter station.

Future Monitoring

9.47 No future monitoring is necessary.

Summary

9.48 The site comprises open land which has been used for agricultural purposes. The potential for widespread contamination to have occurred as a result of this use is low. The site is underlain by the Aylesbeare Mudstone Group which is categorised as a Secondary B aquifer and is not considered to be a sensitive groundwater resource. Disturbance of the aquifer and mobilisation of existing contaminants during construction is unlikely to occur given the former land use and the characteristics of the underlying aquifer.

9.49 The likelihood for localised soil contamination and groundwater to occur during construction and operation as a result of spillages and leaks would be low following the implementation of good practice and the recommended mitigation measures.
References

British Standard BS 10175 (2011) Investigation of Potentially Contaminated Sites


Landmark (2016) Envirocheck Report (87562931)

10 Land Use, Agriculture and Soils

Introduction

10.1 This chapter appraises the likelihood of land use, agricultural and soil impacts from the proposed FAB Link HVDC converter station development near Exeter Airport. This chapter draws on relevant guidance and consultation to inform the appraisal and sets out the proposed measures to mitigate any potential adverse impacts.

10.2 No recreational resources have been identified that lie within or close to the proposed converter station site and therefore no assessment of impacts on recreational receptors is required.

10.3 The assessment considers the likely impacts on the following resources during the construction and operation of the proposed development:

- Soil types and patterns of soils;
- The quality of the agricultural land according to the Ministry of Agriculture, Fisheries and Food (MAFF) Agricultural Land Classification (ALC) guidelines (MAFF, 1988); and
- Farm holdings and/or the farming framework.

Assessment Methodology

Policy and Guidance

National Planning Policy Framework

10.4 Paragraph 109 of the National Planning Policy Framework (NPPF) published in 2012, states that the planning system should contribute to and enhance the natural and local environment by protecting, *inter alia*, geological conservation interests and soils. With regard to the development of agricultural land, NPPF states that: *Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality* (Paragraph 112).

10.5 Recreation is acknowledged as having a key role in the health and well-being of the local population and in promoting healthy communities in Section 8 and paragraph 171.

Planning Practice Guidance

10.6 Planning Practice Guidance (DCLG, 2014), states that local planning authorities are expected to take into account the economic and other benefits of the best and most versatile agricultural land. It also identifies ALC as a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system.

Consultation

10.7 No consultation has been undertaken with stakeholders or consultees to date in respect of Land Use, Agriculture and Soils.
Methodology

Assessment Guidance

10.8 The land use, agriculture and soils assessment takes into account the following advice/guidance, together with professional judgement on the nature and magnitude of change, in order to determine the likely effects on land use (including recreation), agriculture and soil resources.

- Planning Practice Guidance (DCLG, 2014) relating to soils and agricultural land, and open space, sports and recreation facilities, public rights of way and local green space;

Study Area

10.9 The study area comprises the proposed converter station site and temporary compound area, together with any land use, agricultural or recreational resources that are located immediately proximate to the site.

Baseline Methodology

Land Use

10.10 The identification of the existing baseline conditions in relation to agricultural land use and soils has been undertaken by a desk study of available published information and site survey to identify:

- soil types and patterns of soils through the study area;
- the quality of the agricultural land determined by the application of the Ministry of Agriculture Fisheries and Food (MAFF) Agricultural Land Classification system (MAFF, 1988); and
- the nature and pattern of farm holdings or the farming framework across the study area.

Agricultural Land Classification and Soils Desk Study

10.11 A review of existing information, including the following published data, has been undertaken for the assessment of the likely agricultural land classification (ALC) of the study area:

- MAFF: 1 inch to 1 mile ALC Sheet 176] and accompanying Reports;
- Department for Environment Food and Rural Affairs (Defra): Multi-Agency Geographic Information for the Countryside (MAGIC) Portal (Defra, 2016);
- Soil Survey of England and Wales: Soils of South West England 1: 250,000 and accompanying Regional Bulletin;
• British Geological Survey (BGS) data from BGS Internet Portal (BGS, 2016); and

• Met Office Climatological Data for Agricultural Land Classification (The Meteorological Office, 1989).

_Farming Framework_

10.12 Information on the pattern of agricultural land use and the farming framework likely to be affected by the proposed development has been collated from the following sources:

• Government Farming Statistical Data (https://www.gov.uk/government/collections/structure-of-the-agricultural-industry); and

• Other available mapped information that provides information on the characteristics of farming within the study area.

_Potential Impacts – Land Use, Agriculture and Soils_

_Construction Impacts_

10.13 The assessment of impacts is based on the identification of the likely impacts arising during the construction phase of the proposed development. This assessment work includes the consideration of effects set out in Table 10.1 below:

<table>
<thead>
<tr>
<th>Potential Impacts: Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on soil resources arising from the stripping, storage and restoration of soil materials</td>
</tr>
<tr>
<td>Impacts on agricultural land quality – the likely impact on the quality of agricultural land, in particular, on the “best and most versatile” Grade 1, 2 and 3a land due to soil stripping, storage and restoration activities</td>
</tr>
<tr>
<td>Impacts on agricultural land use including the temporary loss of land from landholdings along the cable route or at construction compounds and the likely impacts on the management of land due to construction activities</td>
</tr>
</tbody>
</table>

_Operational Impacts_

10.14 The assessment of impacts is based on the identification of the likely impacts arising during the operational phase of the proposed development. The assessment work includes the consideration of the effects set out in Table 10.2 below:

<table>
<thead>
<tr>
<th>Potential Effects: Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on soil resources – the permanent loss of soil materials</td>
</tr>
<tr>
<td>Impacts on agricultural land quality – the permanent loss of agricultural land quality and in particular the loss of the “best and most versatile” agricultural land</td>
</tr>
</tbody>
</table>
Potential Effects: Operation

Impacts on agricultural land use – the permanent loss of land from landholdings and the impacts on farming operations and workability of holdings.

Limitations of the Assessment

10.15 This assessment has been informed by the results of a desk based baseline study. No site visits have been undertaken but notwithstanding this there are no known limitations that would affect the robustness of the assessment.

Assessment of Construction Impacts

Agricultural Land Use and Soils Baseline

Topography

10.16 The site consists of a two fields including a temporary laydown area to the west, totalling about approximately 7 hectares (ha) in extent, to the north of Long Lane, Clyst Honiton, with Exeter Airport a short distance to the north-west. The highest ground, at about 42 metres (m) above Ordnance datum (AOD) is along Westcott Lane and there is a very gentle slope northwards to about 38 m AOD along the northern boundary.

Climate

10.17 Climatic data has been obtained from the Met Office’s standard 5 km grid point data set for a representative point near the centre of the site and is as follows.

Table 10.3: Climatic Data

<table>
<thead>
<tr>
<th>Reference Point</th>
<th>SY017 934</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude (m)</td>
<td>40</td>
</tr>
<tr>
<td>Accumulated Temperature (day degrees)</td>
<td>1552</td>
</tr>
<tr>
<td>Annual Average Rainfall (mm)</td>
<td>787</td>
</tr>
<tr>
<td>Field Capacity Duration (days)</td>
<td>167</td>
</tr>
<tr>
<td>Moisture Deficit for Wheat (mm)</td>
<td>112</td>
</tr>
<tr>
<td>Moisture Deficit for Potatoes (mm)</td>
<td>106</td>
</tr>
</tbody>
</table>

10.18 The data are typical of the relatively moist but warm conditions of South West England and the climate does not, in itself, impose any agricultural imitation.

Geology

10.19 According to the BGS internet portal (http://www.bgs.ac.uk/data/mapViewers), the bedrock geology is the Aylesbeare Mudstone Group which consists of reddish-brown silty mudstone and clayey siltstone of Permo-Triassic age and which forms part of the so-called Redland of South
Devon. The geological map does not show the presence of any superficial deposits, but the soil map (see below) indicates a thin covering of slightly more loamy material meaning that the soils are formed partly in this and partly in the underlying mudstone and siltstone.

**Soils**

10.20 The site is shown on the detailed 1:63,600 scale soil map produced by the Soil Survey of England & Wales in 1971 (Sheets 325 and 339, Exeter District) in which different kinds of soils are referred to as soil series. The relevant portion of the map is reproduced below, scaled up from the 1:63,360 original.

![Inset 11.1: Soil Survey of England & Wales in 1971 (Sheets 325 and 339, Exeter District)](image)

10.21 The whole site is shown as the Brinsea series (orange brown with map symbol bS), a poorly drained soil developed in thin loamy drift over mudstone, and since renamed the Brockhurst series. This is surrounded by similar but well drained soils of the Whimple series (mid-brown with map symbol wM). The uncoloured area with red dots and map symbol MB is so-called “Mixed Bottom Land” a generalised name for an assortment of poorly drained soils on river alluvium and related deposits.

10.22 The Memoir accompanying the map describes a typical profile of a Brinsea soil as having a dark brown loamy topsoil and prominently mottled loamy upper subsoil over mottled clayey material at around 40-45 cm from the surface. This clayey lower subsoil acts as a Slowly Permeable Layer and is the reason for the colour mottling, called gleying which is characteristic of horizons which are periodically or permanently waterlogged. In the climatic regime of the area, such soils would be in Wetness Class IV on a scale ranging from I (well drained) to VI (very poorly drained).

10.23 The Memoir actually describes the topsoil and upper subsoil as a “loam” but this textural classification has subsequently been revised and re-assessment of the particle size analysis data according to the current system (and that used for ALC purposes) would put the texture as being on the border between a medium clay loam and a medium silty clay loam. This would then bring it into line with the general description of the Brockhurst series (formerly the Brinsea series) in the
Bulletin accompanying the South West England sheet of the 1:250,000 National Soil Map as a fine loamy (i.e. clay loam) or fine silty (i.e. silty clay loam) over clayey soil which is prominently mottled within 40 cm of the surface and typically in Wetness Class IV.

**Agricultural Land Classification**

10.24 The Provisional ALC sheet 176 (Exeter) published at a scale of 1:63,360 shows the site to comprise Grade 3 land.

10.25 Since these published Provisional ALC maps were produced in the 1960s and 1970s, there has been a comprehensive revision to the guidelines and criteria for allocating land to particular grades and the former Subgrades 3b and 3c have been amalgamated into a single Subgrade 3b.

10.26 The main limitation of the Brinsea series soils which dominate the site is winter wetness and workability difficulties. This is assessed in the revised ALC system by taking into account the climatic data, in particular the duration of field capacity over the winter, the Wetness Class and the topsoil texture. Application of the relevant criteria for a soil in Wetness Class IV with a topsoil texture of medium clay loam or medium silty clay loam on a site with a Field Capacity Duration of 167 days is Subgrade 3b.

10.27 Much of the land around Exeter has been the subject of ALC surveys done using the revised (post 1988) system as shows on Figure 10.1. These surveys have included the area of the converter station site and show this to comprise a mixture of mainly Subgrade 3a with a small area of Subgrade 3b. Figure 10.1 shows the distribution of ALC grades across the site and the areas and percentages of ALC grades are as follows:

**Table 10.4: Percentage of ALC Grades Across the Site**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Area (ha)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>3a</td>
<td>5.1</td>
<td>96</td>
</tr>
<tr>
<td>3b</td>
<td>0.2</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>5.1</td>
<td>100</td>
</tr>
</tbody>
</table>

**Agricultural Land Use**

10.28 The proposed converter station site comprises part of the large Rockbeare Estate that comprises a number of arable and grassland farms in the vicinity. This land forms part of the holding based at Southwood Farm. This farm comprises approximately 150 ha of arable and grassland. The converter station site is currently used for arable cropping. There are no farm buildings located within the proposed site.

10.29 In terms of potential impacts of the proposal on the agricultural productivity within the local area, the following table summarises the DEFRA statistical data 2013 (https://www.gov.uk/government/collections/structure-of-the-agricultural-industry) illustrating the distribution of agricultural land use in the Exeter and East Devon District compared to that for England as a whole.
Table 10.5 Farming Statistics Exeter and East Devon

<table>
<thead>
<tr>
<th></th>
<th>Cereals (ha)</th>
<th>Arable (excluding cereals) (ha)</th>
<th>Fruit and Vegetables (ha)</th>
<th>Grassland (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exeter and East Devon</td>
<td>7,249 (12%)</td>
<td>6,270 (11%)</td>
<td>465 (&lt;1%)</td>
<td>44,961 (76%)</td>
</tr>
<tr>
<td>District</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>2,492,296 (30%)</td>
<td>1,372,988 (16%)</td>
<td>128,094 (1.5%)</td>
<td>4,412,696 (52.5%)</td>
</tr>
</tbody>
</table>

10.30 The statistics show the dominance of grassland livestock based farming enterprises in the Exeter and East Devon District with approximately 76% of the farmland comprising agricultural grassland. This contrasts with the higher proportion of arable land within England as a whole which comprises a total of only 52% agricultural grassland.

10.31 The figures identify that the proposed converter station site would represent approximately 0.01% of the total area of farmland within the district.

Agricultural Land Use and Soils Assessment of Impacts

10.32 The permanent loss of agricultural land for the proposed converter station would take place at the beginning of the construction period. The survey work undertaken by Defra identifies that the site comprises a mixture of 5.1 ha of Subgrade 3a and 0.2 ha of Subgrade 3b land. The site therefore comprises a small area of the lowest quality land within the definition of the “best and most versatile” Grades 1, 2 and 3a land. However, the distribution of agricultural land quality in the wider area as shown on Figure 10.1 shows that the quality of land on this site is typical, if not of lower quality than large areas of land around Exeter that have also been surveyed.

10.33 The permanent loss of this small area of land from agricultural production represents approximately 0.01% of the total productive agricultural area within the district. It forms part of a large Estate that comprises a number of farms. The loss of this land would therefore have no noticeable impact on the operation of the wider estate or on the agricultural output within the wider area of the district.

10.34 In addition, an additional area of agricultural land used would be used on a temporary basis as a laydown area adjacent to the proposed converter station site during the construction period. A soil handling methodology would be developed prior to the construction of the converter site, based on recognised best practice, to strip, store and reinstate topsoils and/or subsoil resources within the temporary laydown area. Following the restoration of the soils on the temporary area, the land would be returned to its former agricultural use.

Assessment of Operational Impacts

10.35 There would be no further impacts on the site during operation as all of the land is permanently affected at commencement of construction.
Cumulative Impacts

10.36 The developments identified for consideration are identified on Figure 2.9 and Appendix 2.2.

10.37 There has been extensive detailed ALC survey work carried out using the revised 1988 ALC system within the vicinity of Exeter and these surveys cover the majority of the sites shown on Figure 2.9. These surveys identify that the land within those developments comprises a high proportion of Grades 2 and Subgrade 3a land with land to the west of the M5, comprising proportions of the highest quality Grade 1 land.

10.38 The development of the proposed Converter Station would lead to an additional small cumulative loss of 5.1 ha of Grade 3a land. However, this represents the lowest quality of land within the definition of the “best and most versatile” category which comprises Grades 1, 2 and Subgrade 3a land. Within the context of the dominance of Grade 2 and 3a land in the wider area and the large areas of development already approved close to the site on Grade 2 and Grade 3a agricultural land, this small additional loss of 5.1 ha of Subgrade 3a land would not represent a significant cumulative loss.

Proposed Mitigation Measures

Agricultural Land Use and Soils

10.39 The construction process would take into account the principles of good practice in soil handling and restoration set out in the following documents, wherever possible, to reduce the possibility of damage to soil materials during the construction process:

- DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (including Toolbox Talks); and
- MAFF (2000) Soil Handling Guides

10.40 Important principles to be included are:

- the identification and management of the soil materials on the site;
- separate stripping of identified topsoil and subsoil resources;
- separate storage of stripped topsoil and subsoil materials;
- location of topsoil and subsoil heaps to avoid cross contamination of materials and trafficking of soil heaps by construction traffic;
- maintenance of soil heaps to reduce the potential for losses of materials during storage;
- appropriate timing of soil handling operations;
- Choice of appropriate soil handling machinery; and
- careful supervision of soil handling operations on site.
10.41 A soil handling strategy would be developed by a specialist in advance of construction and implemented by a suitably experienced operative on site.

10.42 In terms of the agricultural use of the land affected by the route during construction, the following measures would be implemented during the construction period, as far as possible:

- the maintenance and reinstatement of existing water supplies and drainage systems;
- the maintenance of access routes across individual fields;
- the maintenance of wider farm access routes;
- appropriate fencing of the construction corridor, dependent upon the nature of the individual farm holding affected; and
- appropriate construction practices to be implemented to ensure that the potential risk for the spread of animal and plant diseases is reduced as far as practicable.

**Summary**

10.43 The site comprises arable agricultural land where no recreational resources would be affected.

10.44 The permanent loss of agricultural land for the proposed converter station would take place at the beginning of the construction period. The survey work undertaken by Defra (Multi-Agency Geographic Information for the Countryside (MAGIC) Portal (Defra, 2016) identifies that the site comprises a mixture of 5.1 ha of Subgrade 3a and 0.2 ha subgrade 3b land. The site therefore comprises a small area of the lowest quality land within the definition of the “best and most versatile” Grades 1, 2 and 3a land. However, the distribution of agricultural land quality in the wider area as shown on Figure 10.1 shows that the quality of land on this site is typical, if not of lower quality than large areas of land around Exeter that have also been surveyed. Therefore the development of the proposed Converter Station would not contribute to a significant cumulative loss of agricultural land.

10.45 The loss of this small area of land from agricultural production represents less than 0.01% of the total productive agricultural area within the district. It forms part of a large Estate that comprises a number of farms. The loss of this land would therefore have no noticeable impact on the operation of the wider estate or on the agricultural output within the wider area of the district.

10.46 There would be an additional area of approximately 2 ha of agricultural land used on a temporary basis as a laydown area adjacent to the proposed converter station site. The stripping, storage and replacement of soils on this area would be carried out in accordance with recognised best practice and following reinstatement the land would be returned to its former agricultural use.
References

Agricultural Land Classification, Provisional Sheet 176 (Exeter), 1:63,360 (1972).


11 Draft Code of Construction Practice

Introduction

General

11.1 This draft Code of Construction Practice (CoCP) relates to the construction of the proposed FAB Link HVDC/HVAC interconnector UK converter station. It sets out the standards to be implemented throughout the construction process in the context of FAB Link Limited’s duties in relation to the preservation of amenity as an interconnector licence holder under Schedule 9 of the Electricity Act 1989.

11.2 The draft CoCP is a strategic document based on available outline design information. It provides a framework of key measures for managing the potential environmental impact of constructing the project that all construction staff will be required to follow. It covers the aspects of the project’s construction phase that may affect the environment and the interests of local residents, businesses, the general public and other sensitive receptors in the vicinity of the construction site.

11.3 The term ‘construction’ in the CoCP includes all site preparation, demolition, material delivery, excavated material disposal, waste removal and all related engineering and construction activities as defined in the planning application.

11.4 The CoCP incorporates legislative requirements, current guidance and best practice measures to define the standards of construction practice that will be required. However, compliance with this CoCP will not absolve the Contractor or subcontractor from compliance with all legislation and byelaws relating to their construction activities.

Implementation of the Code

11.5 The CoCP will be implemented during the planning and undertaking of construction works through a series of detailed method statements to be prepared by the Principal Contractor. The method statements will build on the principles and standards from the CoCP and set out how the individual construction tasks will be undertaken, the plant/equipment required, the environmental controls that will be in place and the roles and responsibilities of the construction team.

Training and Competence

11.6 All levels of site staff will have a responsibility to minimise the risks to the environment from the activities on site and steps will be taken to make them aware of these duties and the environmental requirements of the CoCP. Contractors will be required to operate induction schemes for all personnel to ensure that they are aware of their individual responsibility to comply with the CoCP.

11.7 Contractors will also be responsible for employing an appropriately qualified workforce and for identifying the training needs of their personnel.
Supervision

11.8 Sufficient suitably qualified and experienced personnel will be appointed by the Principal Contractor to supervise the main construction works. This will include professionally qualified environmental management staff, with relevant experience in the environmental disciplines included in this CoCP.

General Requirements

Approach to Construction

11.9 The project will be constructed in an environmentally sensitive manner and will meet the requirements of all relevant legislation, codes of practice and standards. The FAB Link Ltd will review the environmental performance of the main construction contractors as part of the tender selection process.

Health and Safety Principles

11.10 The FAB Link Ltd and its Principal Contractor will apply appropriate industry standards for the health, safety and welfare of its employees to ensure that adequate arrangements are in place for the discharge of all its duties under the Construction (Design and Management) Regulations 2015 (CDM).

Local Community Liaison

11.11 Prior to commencing main construction activities (e.g. earthworks) occupiers of premises in the vicinity of the work will be notified of the nature of the proposed works and contact details to which any enquiries should be directed.

11.12 The Principal Contractor will establish a system for dealing with enquiries or complaints from the public, local authorities and statutory consultees. Any complaints that may arise will be logged, reported and addressed.

11.13 All complaints will be logged and investigated. Where required, mitigation will be implemented and the action taken will be recorded.

Working Hours

11.14 The typical working hours will be from 07:00 – 19:00 hours (Monday to Friday) and from 07:30 to 13:00 on Saturday. Construction personnel and deliveries will usually arrive at, and depart from the site up to one hour before and after the typical hours.

11.15 From time to time specific elements or phases of the project by their nature may require work to be undertaken outside of the typical working hours, either to meet a construction sequence or to complete specific work processes. On these occasions the Principal Contractor will provide details of the type and nature of the works in advance to the Local Authority and take all reasonable steps to ensure that the work does not cause a nuisance at the nearest residential dwellings.
11.16 By exception, and only in the case of an emergency, work may be undertaken outside of the core hours of 07:00 to 19:00 on weekdays and 07:30 to 13:00 on Saturdays without notification to the Local Authority.

**Construction Site layout and Good Housekeeping**

11.17 To reduce the likelihood of either an environmental incident or nuisance occurring, the following measures will be implemented, where relevant:

- Maintaining the cleanliness of working areas, screening of perimeters and provision of adequate staff facilities that discourage waste accumulation;
- Secure storage of waste on site to prevent wind blow. Regular and frequent collection of waste from the site;
- Effective preventative pest and vermin control, including arrangements for disposing of food waste. If infestation occurs, the Principal Contractor will take prompt action to eliminate the infestation and prevent further occurrence;
- Prohibition of open fires;
- Maintenance of wheel washing facilities and/or other containment measures to prevent entrained dirt from being deposited on the highway;
- The layout and where possible, the location of site accommodation to avoid overlooking residential property;
- Containing and limiting visual intrusion of the construction site, where reasonably practicable;
- No discharge of site runoff to ditches, watercourses, drains, sewers or soakaways without agreement of the appropriate authority; and
- Provision of maps showing sensitive areas and buffer zones where no pollutants (e.g. fuels, oils and other chemicals) are to be stored or used.

**Site Lighting**

11.18 Site lighting and signage will be provided to enable the safety and security of the construction site. Lighting will be at the minimum luminosity necessary and use low energy consumption fittings.


11.20 Lighting will also be designed, positioned and directed so as not to unnecessarily intrude on adjacent buildings, ecological receptors and other land uses to prevent unnecessary disturbance,
interference with the amenity of local residents or passing motorists. This provision will apply particularly where night working is required.

**Site Security**

11.21 The site boundary will be secured so that the opportunity for unauthorised entry is minimised. Access to the site will be limited to specified entry points and personnel entrances/exits will be recorded for security and health and safety purposes.

**Hoardings, fencing and screening**

11.22 The following measures will be applied as appropriate:

- Provision and maintenance of adequate fencing and hoardings to an acceptable condition to prevent unauthorised access to the construction site; and
- Providing site information boards with out of hours contact details, 24 hour telephone number (for comments/complaints), community information and information on the works programme, at key locations.

11.23 The type of screening or fencing used will be selected to suit the location and purpose. All boundary fences/screens will be maintained in a tidy condition and fit for purpose.

11.24 All construction areas will remain securely fenced at all times during construction. All temporary screening and fencing will be removed as soon as reasonably practicable after the completion of the works.

**Pollution Prevention Measures**

11.25 The Principal Contractor will develop and implement appropriate measures to control the risk of pollution due to construction works. This will include a pollution incident control plan which recognises the risk of pollution from construction activities and presents pro-active management practices to ensure that any pollution incident that may occur (e.g. a diesel spill) is minimised, controlled, reported to relevant parties and remediated.

**Emergency Preparedness**

11.26 The client and Principal Contractor will ensure that emergency procedures are developed for the site. The procedures will be appropriate to the anticipated hazards and the specific layout of the site. The emergency procedure will contain emergency phone numbers and the method of notifying statutory authorities. Contact numbers for the key staff of the nominated undertaker will also be included.

**Fire Prevention and Control**

11.27 All construction sites and associated accommodation and welfare facilities will have in place appropriate plans and management controls to prevent fires.
Management of Environmental Issues

Ecology and Nature Conservation

11.28 Mitigation measures recommended in Chapter 3 to address potential impacts on the individual important ecological receptors, although in many cases they are interlinked and likely to be of benefit to more than one species/group. The mitigation measures here refer to mitigation required both during the construction period and in the longer term during the operational phase.

Dust

11.29 Dust generated during construction will be suppressed by the use of damping using bowsers or other measures.

Drainage and Spillage Control

11.30 A temporary drainage plan will be designed and implemented to ensure that any run-off or other waters generated during construction are suitably contained and treated prior to discharge. This will prevent the deposition of water-borne solids onto designated areas (and possibly ponds) through the local field ditch system.

11.31 The ditch system is not particularly strongly defined in the area around the proposed development site, and is unlikely to be a well-defined pathway for water-borne contamination. Good housekeeping measures, particularly relating to storage and use of fuels and other toxic substances, will be in place and adhered to.

11.32 An appropriate emergency plan relating to unexpected spillages, leakages or other contamination incidents will be in place, and all operatives and contractors will be briefed on the appropriate actions to take.

Hedgerows and Trees

11.33 All excavations and earthworks for the construction of the converter station will be carried out outside of the canopy area of mature standard trees to be retained. Such protective strips will be fenced off to prevent accidental encroachment during the works.

Birds

11.34 Any site clearance of vegetation should avoid the bird nesting season where possible, which runs approximately from March-August inclusive (although nesting birds and their eggs are protected at any time under the WCA).

11.35 This should include any clearance associated with hedgerows (assumed to be limited to new access points and cable entry and exit points).

11.36 However, if the field itself is left fallow for a farming cycle prior to commencement of construction works, it should also be considered as potential bird-nesting habitats. For example, if a crop is removed from the field in September of the previous year and it is then left un-managed until April of the following year, it should not be assumed to be free of nesting birds, because such conditions may attract some species of ground-nesting birds.
11.37 Where initial site clearance within the bird nesting season cannot be avoided, it will be necessary to carry out detailed inspections by suitably experienced ecologists to ensure that no nests are present. Should active nests be encountered, suitable exclusion zones would need to be set up (advised by the ecologist on the basis of the nest location and species of bird involved).

**Bats**

11.38Retention of individual trees and hedgerows (including reinstatement of existing gateways) would be of benefit to bats as these are the features currently used by all species present in the area.

11.39 If temporary works lighting and night works are required during the period March-October when bats are likely to be most active, a temporary lighting design should be developed and agreed between the contractor and a suitably experienced bat ecologist to limit the extent of light spill onto the boundary hedges. Although lighting attracts some species of bats, it deters others, and the aim should be to maintain similar lower lighting conditions to that presently in place in an area which is somewhat over-lit already due to the presence of the Environment Agency storage compound, nearby A30 and airport runway and other facilities.

11.40 Permanent operational lighting will not be required and that a similar lighting state to that currently in the area would be maintained, which would therefore have no impact on bats (for the same reasons described above). If occasional lighting is required during the operational phase, the lighting design will be low level down-lit and would only be used during operational visits. This would avoid light spill onto the existing hedgerows and, as far as possible, on the new woodland planting buffers (which would increase screening of light as they develop in any case).

11.41 Although not required for the construction of the proposed development, should any of the trees identified with moderate or high potential for bat roosts require removal, either unexpectedly as a part of the construction works, or in the longer term, they should be thoroughly assessed for the presence of bat roosts by a suitably qualified, experienced and licensed bat ecologist, prior to these works. Sufficient time should be allowed to obtain a licence under the CHSR for the closure of a bat roost, should this be required. As with all wildlife mitigation licenses, a detailed mitigation method statement demonstrating how all measures outlined can be achieved would be required to accompany any application.

**Dormice**

11.42 The presence of dormice is unlikely, but cannot be completely ruled out. As a precautionary measure, where the proposed development requires hedgerow removal, whether temporary or permanent, it should be carried out following a phased approach as set out in the Dormouse Conservation Handbook (Bright et al, 2006).

11.43 This indicates that it is appropriate to remove upstanding vegetation (trees and shrubs) during the period November to March while dormice would be in hibernation, utilising hibernation nests located on the ground at base of trees etc. On awakening in April or May, dormice would be persuaded to move into adjacent un-cleared areas which would still be within their home range (averaging 50 m), avoiding potential issues of conflicts between dormice which are strongly
Clearance of upstanding vegetation during this period has the additional benefit that it is done during the period when birds are unlikely to be nesting.

11.44 Clearance of the ground levels (including hedge-banks) can then be undertaken in the period June-September, when any dormice present would be active and living within the hedge canopy.

11.45 Prior to each phase of clearance the area should be inspected by a suitably experienced dormouse ecologist to ensure that no dormice are present which could be injured by the clearance works. These should inspect all basal areas prior to commencement of winter vegetation clearance to ensure no hibernation nests are present.

Badgers

11.46 Although badgers are not considered to be at risk of impacts as a result of the proposed development, measures have been included here to ensure that the status of badgers has not changed prior to commencement of the proposed development.

11.47 Badgers are quite dynamic and may excavate and occupy new setts within their existing territory, or occupy neighbouring territories, it will be necessary to ensure the current status is checked and confirmed again prior to commencement of construction. A pre-commencement badger survey by a suitably experienced badger surveyor should be undertaken no more than 6 months prior to commencement of construction to ensure that no new setts have been excavated in any location which would be damaged or badger using it disturbed by the works. Should any such setts be identified, an appropriate licence under the PBA should be sought from Natural England. Any such application would need to be accompanied by a suitably robust and demonstrably deliverable mitigation scheme.

Landscape

11.48 Existing vegetation bordering the laydown area will be retained and protected during construction as it provides an important landscape framework for the proposed converter station. Soils required for the landscaping scheme will be separately stored and protected.

Archaeology and Cultural Heritage

11.49 A programme of archaeological evaluation will be undertaken with regard to a linear anomaly recorded by the geophysical survey, which is on a different alignment to the existing and former field boundaries and may therefore have a different origin. The initial phase of the archaeological evaluation will be in the form of trial trenches placed to intercept the linear anomaly. Further, more detailed, investigation may be required depending on the results of the trial trenching.

11.50 The archaeological evaluation will be undertaken ahead of the commencement of construction and will be in line with a written scheme of investigation that would be agreed in advance with the archaeological advisor to the planning authority.
Transport

11.51 Traffic management measures will be adopted at various locations. These will consist of a range of measures to assist with the movement of vehicles along the local road network and to ensure road safety is not compromised.

11.52 The traffic management measures to be adopted will include the following:

- All vehicular access during construction will be taken from Long Lane with localised widening and the provision of additional passing places such that vehicles would always have clear forward visibility to the next passing place, which would prevent oncoming vehicles meeting between passing places and eliminate the need for any vehicles to reverse.

- The proposed locations of the passing places are identified in the Transport Assessment. They will be subject to detailed design and subsequent technical checks by Highway Officers at Devon County Council.

- Two access junctions to the site are proposed onto the northern side of Long Lane to facilitate access and egress.

- The Principal Contractor will prepare a detailed Construction Traffic Management Plan (CTMP) once the detailed design of the infrastructure is complete. The CTMP will include measures to control HGV movements and avoid the network peak periods (typically weekdays 08:00 to 09:00 and 17:00 to 18:00).

- Temporary reduced speed limits along the public highway will be discussed with Highway Officers and implemented if considered appropriate.

- Strict vehicle routeing will be imposed in accordance with agreed routeing plans.

- Where practical, local suppliers will be used so as to minimise the distance travelled by HGVs.

- Wheel wash facilities will be provided at key locations to ensure mud and dust is not deposited on the public highway.

- All HGVs will be sheeted to avoid dust and the spillage of materials onto the public highway.

- Use of local logistics compounds will be considered to minimise the distance travelled by HGVs.

- HGV movements will be continually monitored as will adherence with agreed measures and parameters in any construction traffic management plan.

- Road condition surveys will be undertaken in full liaison with Highway Officers to identify any extraordinary damage caused as a result of the construction HGVs.
Air Quality

11.53 The following measures will be implemented to mitigate construction dust risk. They are taken from the Institute of Air Quality Management’s guidance (IAQM, 2014 ‘Guidance on the Assessment of Dust from Demolition and Construction Sites’) based on a medium dust impact risk.

Table 11.1: IAQM Mitigation Measures

<table>
<thead>
<tr>
<th>11.54 Communications</th>
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<tbody>
<tr>
<td>▪ Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.</td>
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<table>
<thead>
<tr>
<th>11.55 Site Management</th>
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<tbody>
<tr>
<td>▪ Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.</td>
</tr>
<tr>
<td>▪ Make the complaints log available to the local authority when asked.</td>
</tr>
<tr>
<td>▪ Record any exceptional incidents that cause dust and/or air emissions, either on-site or off-site, and the action taken to resolve the situation in the log book.</td>
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<table>
<thead>
<tr>
<th>11.56 Preparing and maintaining the site</th>
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<tbody>
<tr>
<td>▪ Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Use screening intelligently where possible – e.g. locating site offices between potentially dusty activities and the receptors.</td>
</tr>
<tr>
<td>▪ Erect solid screens or barriers around the site boundary.</td>
</tr>
<tr>
<td>▪ Avoid site runoff of water or mud.</td>
</tr>
<tr>
<td>▪ Keep site fencing, barriers and scaffolding clean.</td>
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<thead>
<tr>
<th>11.57 Operations</th>
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<tbody>
<tr>
<td>▪ Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible.</td>
</tr>
<tr>
<td>▪ Use enclosed chutes, conveyors and covered skips, where practicable.</td>
</tr>
<tr>
<td>▪ Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.</td>
</tr>
<tr>
<td>▪ Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.</td>
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<table>
<thead>
<tr>
<th>11.58 Waste management</th>
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<tbody>
<tr>
<td>▪ Avoid bonfires and burning of waste materials.</td>
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</table>

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<tr>
<th>11.59 Medium risk measures specific to construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.</td>
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<table>
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<tr>
<th>11.60 Medium risk measures specific to trackout</th>
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</thead>
<tbody>
<tr>
<td>▪ Use water-assisted dust sweeper(s) on the access and local roads, to remove, as soon as practicable any material tracked out of the site. This may require the sweeper being continuously in use.</td>
</tr>
<tr>
<td>▪ Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.</td>
</tr>
</tbody>
</table>
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as practicable;
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site).

11.61 Dust deposition monitoring in accordance with IAQM guidance (IAQM, 2012) will be carried out in order to demonstrate that the above controls are working:

"Monitoring dustfall (as mass deposition rate and/or soiling rate) at nearby receptors is also required, together with monitoring of dust flux across the site boundary (if there is a need to distinguish the contributions of the site from other sites or the general background)."

**Noise and Vibration**

**Construction Noise Impacts**

11.62 Construction works will follow Best Practicable Means (BPM) as defined in Section 72 of the Control of Pollution Act 1974 (as amended) to minimise noise and vibration impacts. These details will be submitted to and agreed in writing with EDDC prior to commencement of construction activities and following the appointment of the Principal Contractor. These are based upon the guidance contained in BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Part 1: Noise' and 'Part 2: Vibration' (British Standards Institution, 2014a, 2014b):

- **Communication**: A Local Liaison Committee will be established, and occupiers of residential and business properties that are likely to be affected by the works will be notified in advance of the works. A named individual will be appointed to take primary responsibility for the day-to-day implementation of the CoCP during the construction phase and to act as the first point of contact on environmental matters for EDDC, other external bodies and the general public. Information regarding the nature and duration of the works, and named contact details for key members of staff will be displayed on a noticeboard near to the site.

- **Standard construction hours**: core working hours will be 07:00 to 19:00 hours Monday to Friday, 07:30 to 13:00 hours on Saturday and at no time on Sundays or on public or bank holidays. In the event that noise generating works are required outside of core working hours, this would be agreed with EDDC prior to commencement of the activity. **Access routes**: Vehicles will follow the prescribed access route to the site from the A30 Clyst Honiton junction, east along the B3182, left onto Long Lane adjacent to the entrance to Exeter Airport and along Long Lane.

- **Equipment**: Quieter alternative methods, plant and equipment will be used, where reasonably practicable.

- **Worksite**: Plant, equipment, site offices, storage areas and worksites will be positioned away from existing noise sensitive receptors, where reasonably practicable.

- **Screening**: Portable acoustic enclosures/screens will be used, as required.
• **Maintenance**: All vehicles, plant and equipment will be maintained and operated in an appropriate manner, to ensure that extraneous noise from mechanical vibration, creaking and squeaking is kept to a minimum.

**Measures to Protect Water Quality**

11.63 Potential impacts to the water environment will be avoided where possible through careful consideration of location and construction techniques of the converter station.

**Best Practice Measures**

• All construction work will be undertaken in accordance with the Code of Construction Practice, and guidance including:
  
  - Environment Agency, Pollution Prevention Guidance Note 6 (PPG6): Pollution Prevention Guidelines – Working at Construction and Demolition Sites;
  
  - Environment Agency, Pollution Prevention Guidance Note 5 (PPG5): Working in, near or liable to affect watercourses;
  
  - Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C650); CIRIA – SuDS Manual;

• Contamination of surface waters during earthworks operations will be prevented as no discharge to surface watercourses will occur without permission from the EA (SuDS Manual);

• Wheel washers and dust suppression measures to be used as appropriate to prevent the migration of pollutants (SuDS Manual);

• Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual); and

• A construction method statement to be submitted for approval by the responsible authority (SuDS Manual).

**Pollution Prevention Measures**

• Refuelling of machinery will be undertaken within designated areas where spillages can be easily contained. Machinery will be routinely checked to ensure it is in good working condition.

• Any tanks and associated pipe work containing substances included in List 1 of the Groundwater Directive will be double skinned and be provided with intermediate leak detection equipment.

• Appropriate spill kits will be provided on the construction site and laydown areas and staff will be trained in their use.
• Construction workers will be informed of the location of the infilled pond and the potential for localised contamination. Training will also be provided on the olfactory and visual signs to be aware of and the procedure to follow if contamination is suspected.

• The following specific mitigation measures for the protection of surface water during construction activates will be implemented:

  - Management of construction works will comply with the necessary standards and consent conditions as identified by the EA;
  
  - A briefing highlighting the importance of water quality, the location of watercourses and pollution prevention will be included within the site induction;
  
  - Areas with prevalent run-off will be identified and drainage actively managed, e.g. through bunding and/or temporary drainage;
  
  - Areas at risk of spillage, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) will be bunded and carefully sited to minimise the risk of hazardous substances entering the drainage system or the local watercourses. Additionally the bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage. Bunds used to store fuel, oil etc. will have a 110% capacity of the volume of fuel, oil etc. to be stored;
  
  - Disturbance to areas close to watercourses will be reduced to the minimum necessary for the work;
  
  - Excavated material will be placed in such a way as to avoid any disturbance of areas near to the banks of watercourses and any spillage into the watercourses;
  
  - Construction materials will be managed in such a way as to effectively minimise the risk posed to the aquatic environment;
  
  - All plant machinery and vehicles will be maintained in a good condition to reduce the risk of fuel leaks;
  
  - Drainage works will be constructed to relevant statutory guidance and approved via the Lead Local Flood Authority prior to the commencement of construction; and
  
  - Consultation with the EA will be ongoing throughout the construction period to promote best practice and to implement proposed mitigation measures.

**Agricultural Land Use and Soils**

11.64 The construction process will take into account the principles of good practice in soil handling and restoration set out in the following documents, to reduce the possibility of damage to soil materials during the construction process:
• DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (including Toolbox Talks); and

• MAFF (2000) Soil Handling Guides

11.65 Important principles to be included are:

• the identification and management of the soil materials on the site;

• separate stripping of identified topsoil and subsoil resources;

• separate storage of stripped topsoil and subsoil materials;

• location of topsoil and subsoil heaps to avoid cross contamination of materials and trafficking of soil heaps by construction traffic;

• maintenance of soil heaps to reduce the potential for losses of materials during storage;

• appropriate timing of soil handling operations;

• choice of appropriate soil handling machinery; and

• careful supervision of soil handling operations on site.

11.66 A soil handling strategy will be developed by a specialist in advance of construction and implemented by a suitably experienced operative on site.

11.67 In terms of the agricultural use of the land affected by the route during construction, the following measures will be implemented during the construction period, as far as possible:

• the maintenance and reinstatement of existing water supplies and drainage systems;

• the maintenance of access routes across individual fields;

• the maintenance of wider farm access routes;

• appropriate fencing of the construction corridor, dependent upon the nature of the individual farm holding affected; and

• appropriate construction practices to ensure that the potential risk for the spread of animal and plant diseases is reduced.