



UK – FRANCE HVDC INTERCONNECTOR

SCOPING REPORT FOR ENVIRONMENTAL IMPACT ASSESSMENT

Onshore UK

February - 2018

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Scoping Report - Onshore UK

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Acronyms and Abbreviations

ACRONYM	DEFINITION
µT	Microtesla
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BEIS	Department for Business, Energy and Industrial Strategy
BGS	British Geological Society
BMV	Best and Most Versatile
CDE	Construction, Demolition and Excavation
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CO ₂	Carbon Dioxide
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
DCLG	Department for Communities and Local Government
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EHLCA	East Hampshire Landscape Character Assessment
EIA	Environmental Impact Assessment
ELF	Extremely Low Frequency
EMF	Electric and Magnetic Fields
EPC	Engineer, Procure, Construct
ES	Environmental Statement
FRA	Flood Risk Assessment
ft	foot
GHG	Greenhouse Gas
GLVIA	Guidelines for Landscape and Visual Assessment
GWMP	Groundwater Management Plan
ha	Hectare
HBIC	Hampshire Biodiversity Information Centre
HDD	Horizontal Directional Drilling
HEDBA	Heritage Environmental Desk Based Assessment
HER	Historic Environment Record
HGV	Heavy Goods Vehicles
HPI	Habitats of Principal Importance
HVAC	High Voltage Alternating Current
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IAN	Interim Advice Notice
IAQM	Institute of Air Quality Management
ICNIRP	International Commission on non-Ionizing Radiation Protection
IEMA	Institute of Environmental Management and Assessment
IOM	Institute of Occupational Medicine
JNCC	Joint Nature Conservation Committee
km	Kilometre
kV	Kilovolt
kV/m	kilovolts per metre
LCA	Landscape Character Assessment
LGS	Local Geological Sites

ACRONYM	DEFINITION
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LPA	Local Planning Authority
LVA	Landscape and Visual Impact Assessment
m	Metre
MAFF	Ministry for Agriculture, Fisheries and Food
MCA	Marine Character Area
mm	Millimetre
MMO	Marine Management Organisation
MMP	Materials Management Plan
MW	Megawatt
NCAP	National Character Area Profile
NERC	Natural Environment and Rural Communities
NHL	National Heritage List
NO ₂	Nitrogen Dioxide
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
nT	nanotesla
OFGEM	Office of Gas and Electricity Markets
OHL	Overhead Lines
ONS	Office for National Statistics
OS	Ordnance Survey
PAS	Portable Antiques Scheme
PEA	Preliminary Ecological Appraisal
PHE	Public Health England
PIA	Personal Injury Accident
PM	Particulate Matter
PRA	Preliminary Risk Assessment
PRF	Potential Roost Features
PRoW	Public Right of Way
PUSH	Partnership for Urban South Hampshire
RIGS	Regionally Important Geological Sites
RVEI	Road Verges of Ecological Importance
SAC	Special Area of Conservation
SCI	Sites of Community Importance
SDNP	South Downs National Park
SDNPA	South Downs National Park Authority
SINC	Site of Importance for Nature Conservation
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
TJB	Transitional Joint Bay
TJP	Transitional Joint Pit
UK	United Kingdom
V/m	volts per metre
WCCLCA	Winchester Landscape Character Assessment
WFD	Water Framework Directive
XLPE	Cross-linked Polyethylene
ZTV	Zone of Theoretical Visibility

1 Introduction

1.1 Background and Context

- 1.1.1 AQUIND Limited (the 'Applicant') is intending to submit applications for planning permission and marine consent (hereafter referred to as the 'Application') for the development of a new subsea and underground High Voltage Direct Current (HVDC) power cable transmission link between Normandie in France and the south coast of England, that will also include fibre optic data transmission cables of a smaller diameter. With a nominal rating of 2,000MW, the AQUIND HVDC Interconnector (the 'Project') will significantly increase the cross-border capacity between the UK and France, increasing competition and improving security of the electricity supply in each of the respective countries. To enhance the security of the installation and the availability of its power transfer capability, the scheme is being designed as two independent links, each of 1,000MW capacity.
- 1.1.2 The Applicant is the holder of an Electricity Interconnector Licence under Section 6 (1) (e) of the Electricity Act 1989 granted on 9th September 2016 by Office of Gas and Electricity Markets (OFGEM).
- 1.1.3 This EIA Scoping Report (hereafter referred to as the 'Scoping Report') is submitted in accordance with Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') with a request for an EIA Scoping Opinion. It sets out the likely significant environmental effects to consider in the Environmental Statement for the 'UK onshore' aspects of the Project, which include; the HVDC converter station, landfall works, High Voltage Alternating Current (HVAC) underground cables and the HVDC underground cables and fibre optic data transmission cables in the UK (the 'Proposed Development'). A separate EIA Scoping Report for the UK marine elements of the Project will be submitted to the Marine Management Organisation (MMO) under the Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2017.
- 1.1.4 The proposed cable route for the Project will be approximately 245km long, connecting the UK and French transmission networks. Converter stations will be constructed in the UK and in France, where these HVDC cables will terminate (please see Section 2 of this Scoping Report for further information in this regard). The proposed site location and indicative site boundaries for the UK onshore elements of the Project are shown on Figure 1.1.
- 1.1.5 For the UK onshore elements of the Project it is proposed that a hybrid planning application is submitted, to permit the cable route in detail and the converter station and associated infrastructure in outline with all matters reserved.
- 1.1.6 The UK converter station will be located west of the village of Lovedean within the administrative boundary of East Hampshire District Council or Winchester City Council, adjacent to the existing National Grid Lovedean substation. The proposed cable route will travel through the administrative boundary of East Hampshire District Council, Winchester City Council, Havant Borough Council and Portsmouth City Council. The cable route will reach its proposed landfall location at Eastney, a district in the south-east of the Portsmouth.
- 1.1.7 The Applicant has appointed a Project Team, which includes:
- WSP - Engineering, UK planning and UK terrestrial EIA services, Marine consent applications in the UK;

- Herbert Smith Freehills - Legal advisor;
- GVA - UK land agent;
- built environment communications group (formerly - Remarkable Pendragon) – Stakeholder management and public engagement in the UK;
- Arcadis – French planning, French terrestrial consents, stakeholder management and public engagement in France; and
- Natural Power – UK marine EIA services and marine consents in France.

1.2 Planning Consent and the Need for an Environmental Impact Assessment

Consent Process in the UK

- 1.2.1 The Proposed Development falls within the areas of administration of four Local Planning Authorities (LPAs) and will therefore require Planning Permission from each in relation to the parts of the Proposed Development within their respective areas. The LPAs where the Proposed Development is to be located are as follows: (see **Table 1.1 and Figure 1.2**)
- East Hampshire District Council;
 - Havant Borough Council;
 - Portsmouth City Council; and
 - Winchester City Council.
- 1.2.2 As stated above, due to the nature of the works associated with the Proposed Development, it is anticipated that an application for outline planning permission will be submitted for the proposed converter station and the associated HVAC infrastructure, as full details of this aspect of the Proposed Development will not be known at the time of submission. Applications for detailed planning permission will be submitted for the cable route between the converter station and the landfall site and works at the landfall site (see **Table 1.1** below). This will be confirmed following consultation with the relevant LPAs.
- 1.2.3 The EIA Regulations require that, before consent is granted for certain types of development, an EIA must be undertaken to assess the likely significant environmental effects arising as a consequence of that development. The EIA Regulations prescribe types of development which must be subject to an EIA (referred to as Schedule 1 Development) and other types of development, which may require assessments if they meet certain thresholds and criteria (referred to as Schedule 2 Development).
- 1.2.4 The Proposed Development does not constitute either Schedule 1 Development or Schedule 2 Development. However, due to the environmental and human sensitivities within and surrounding the Proposed Development, the Applicant has chosen to voluntarily undertake an EIA and prepare and submit an ES with the Application to report the likely significant effects.
- 1.2.5 WSP has been commissioned to prepare this Scoping Report and the subsequent ES in accordance with the EIA Regulations to accompany the UK elements of the Application.

Consent Process in France

- 1.2.6 Under articles L181-1 and R181-1 du *Code de l'Environnement*, an *Autorisation Environnementale* will be required for the Proposed Development. This authorisation

will be sought through the submission of reports constituting the EIA under the European Directive 85/337/EEC (amended with 2011/92/EU and 2014/52/EU) that will report the likely significant effects of the Project as well as the attempts made to avoid, reduce and mitigate these effects. Additionally, the converter station will be the object of a *Permis de Construire* (building permit) under articles L421-1 and R421-1 of the *Code de l'Urbanisme*.

1.3 Purpose and Structure of Scoping Report

- 1.3.1 For completeness, this Scoping Report covers all onshore elements of the development within the UK. It sets out the approach to the EIA for the UK converter station, cable route and landfall; and will be submitted to each LPA. The relevant aspects of the Proposed Development and which LPA's administrative boundary those elements are within are listed in **Table 1.1** and shown in **Figure 1.2**.

Table 1.1: The aspect of the Proposed Development affecting each Local Planning Authority

LOCAL PLANNING AUTHORITY	ASPECT OF PROPOSED DEVELOPMENT
Winchester City Council	Converter station (Option B) Cable route
East Hampshire District Council	Converter station (Option A) Cable route
Havant Borough Council	Cable route
Portsmouth City Council	Cable route Landfall

- 1.3.2 We anticipate that it will only be necessary for each of the relevant LPA's to consider the likely significant environmental effects only in so far as they related to development within or in close proximity to their respective administrative boundaries. The cable route, for example, runs through all LPAs and so we would expect all LPAs to respond to the assessment of the cable route. Whereas the landfall is solely within the jurisdiction of Portsmouth City Council. We would therefore only expect Portsmouth City Council to comment on the likely significant environmental effects with respect to the landfall. Similarly, the converter station options are located within the administrative boundaries of Winchester City Council and East Hampshire District Council; therefore we would not expect significant feedback from the other LPAs in relation to that aspect of the scheme.
- 1.3.3 The relevance of certain environmental issues to particular LPAs is clarified at the beginning of each technical chapter to this Scoping Report to assist with the preparation of LPA Scoping Opinions.
- 1.3.4 Under the terms of Regulation 15 (4) of the EIA Regulations, the LPAs are required to consult with [at least] the key statutory consultation bodies identified in Regulation 2(1) of the EIA Regulations, before issuing their formal Scoping Opinion to agree the key issues and proposed methodologies to be included in the ES and to provide their input and comments into the formal Scoping process. In accordance with the EIA Regulations, each LPA is required to respond with a Scoping Opinion within 5 weeks of receipt of this Scoping Report.

- 1.3.5 In preparing this Scoping Report, the National Planning Practice Guidance (NPPG) ‘Environmental Impact Assessment’ (2014) has been considered which indicates that *“if required, they (an EIA) should limit the scope of assessment to those aspects of the environment that are likely to be significantly affected.”*
- 1.3.6 This Scoping Report has been informed by the baseline information compiled to date.
- 1.3.7 **Table 1.2** confirms the detail provided in this Scoping Report informed by EIA Regulation 15.

Table 1.2: Information provided as part of Scoping Report

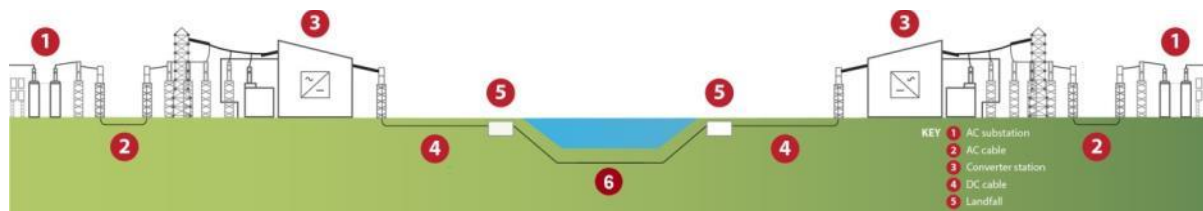
INFORMATION	LOCATION IN THIS SCOPING REPORT
A plan sufficient to identify the land	Figure 1.1
A brief description of the nature and purpose of the development.	Sections 1 and 2
An explanation of the likely significant effects of the Proposed Development on the environment	Sections 5 to 18
An overview of the conditions present on site and in the surrounding area [together with a brief overview of the relevant planning history, policy context]	Section 2 and 4
How alternatives will be considered	Section 3.6
List of known committed developments for purposes of cumulative assessment	Section 3.7
Scope of the proposed application reports to be submitted.	Section 1
The proposed approach to the EIA and an appraisal of the key environmental issues to be covered in the EIA (i.e. “scoped in”). Any issues not requiring further consideration (i.e. “scoped out”) in the context of the key legislative and policy documents and Part 1 of Schedule 4 of the EIA Regulations 2017 as is reasonably required to assess the likely significant environmental effects of the development.	Section 3
Outline of the scope and assessment methodology (including the significant criteria to be adopted) for assessing the likely significant environmental effects to be employed for each respective discipline to be reported in the ES.	Section 3
The proposed structure and format of the ES which will comprise four main parts – a Non-technical Summary, Volume 1 Environmental Statement Text and Figures, Volume 2 Environmental Statement Technical Appendices and Volume 3 Landscape, Visual Impact Assessment.	Appendix 2

2 Project Description

2.1 Introduction

2.1.1 The Project will comprise the following components; HVDC subsea cables, Land/sea transition joint, HVDC underground cables, HVAC underground cables, and supporting infrastructure in the form of HVDC converter stations in the UK and France.

2.1.2 The components of an HVDC Interconnector Project are shown in **Inset 2.1** below.



1. AC grid sub-stations
2. HVAC underground cables
3. HVDC converter stations
4. HVDC underground cable
5. Land/sea transition joint
6. HVDC subsea cable

Inset 2.1: Diagram of Main Interconnector Components

2.2 Site Context, Including Sensitive Environmental Features

Substation and Converter Station

2.2.1 In order to facilitate the HVAC cable connection between the existing National Grid Lovedean substation and the new HVDC power converter station, there will be a requirement to extend the existing outdoor electrical infrastructure which exists within the National Grid substation. All works to extend the outdoor electrical infrastructure will take place within the National Grid fence compound. Agreement will be sought with the LPAs with respect to the proposed scopes and assessment methodologies given in this report.

2.2.2 A new HVDC converter station (hereafter referred to as the 'proposed converter station') is proposed adjacent to the existing National Grid substation in Lovedean, Hampshire. The proposed converter station will be less than 2km from Lovedean substation and will be connected by two 400kV underground cable circuits running through fields. Currently two site options are under consideration: Option A and Option B, both of which are located within the indicative site boundary and shown in **Figure 1.1**. The closest village to the locations for the proposed converter station is Lovedean, approximately 1.3km to the south-east. There are some residential properties, including a small cluster of approximately five properties on Broadway Lane, approximately 0.3km to the east of the proposed converter station. Roads surrounding the proposed converter station include Broadway Lane to the east and Old Mill Lane to the west.

2.2.3 In either location (Option A or Option B) the proposed converter station will be surrounded by a patchwork of agricultural fields and woodland. Crabdens Copse, Stoneacre Copse and Crabdens Row are three areas of Ancient Woodland (totalling

3.57 ha) surrounding Lovedean substation to the north east and south west. Other woodland that surrounds Lovedean substation and is adjacent to the proposed converter station options is deciduous woodland (Priority Habitat Inventory) and broadleaved woodland (National Forest Inventory). The proposed converter station site is located approximately 0.4km south of the South Downs National Park (SDNP). Yeoll's Copse Local Nature Reserve (LNR) is approximately 1.5km to the east.

- 2.2.4 The closest Listed Building (Grade II The Old Thatched Cottage) is approximately 1.2km to the east of the two locations under consideration for the proposed converter station.
- 2.2.5 The land surrounding the proposed converter station is classified by the Environment Agency as Flood Zone 1, so a low risk from flooding. There are no Air Quality Management Areas (AQMA) within the proposed converter station or in the surrounding area.
- 2.2.6 The existing Lovedean substation, the HVDC and fibre optic cables, proposed converter station and part of the HVAC cables are within Bedhampton and Havant Springs Source Protection Zone.

Converter to Landfall Cable Route (Land HVDC cable route)

- 2.2.7 The proposed cable route for HVDC and fibre optic cables (hereafter referred to as the 'cable route') will run from the proposed converter station west of Lovedean, south to the landfall at Eastney, passing Waterlooville, Purbrook, Cosham, and east of the City of Portsmouth. Where possible, the cable route will be located within the highway. There will be four DC cables, laid as two separate pairs of cables (in most cases), with each cable pair located within a separate trench. Each trench will also include a separate duct to facilitate installation of fibre optic cables along the underground cable route. These are essential for converter station control systems and communication.
- 2.2.8 There are a number of Listed Buildings along the proposed cable route and in the surrounding areas. The proposed cable route crosses, and for a short section, in the Portsmouth area, runs adjacent to, Langstone Harbour which is designated as a Ramsar Site, Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) and Special Protection Area (SPA). Other ecologically sensitive areas include the previously discussed Ancient Woodland within 500m of the route.

HVAC Cable Route

- 2.2.9 The proposed 400kV HVAC cable route will pass through agricultural land to connect the new converter station to the existing National Grid Lovedean substation.
- 2.2.10 The 2,000MW – 2075MW connection can be achieved with two circuits into Lovedean 400 kV substation. Given that each circuit will require one cable (or two) for each conductor phase (total of three phases); at least six (or twelve) AC cables will be required to connect the proposed converter station to the existing substation. The quantity required will be confirmed by the submission of reserved matters for the proposed converter station.

Landfall Location

- 2.2.11 The proposed landfall location (hereafter referred to as the 'landfall') is in the district of Eastney, to the south east of Portsmouth, Hampshire. There are existing

residential properties directly to the north of the landfall. To the south of the landfall is the English Channel.

- 2.2.12 Langstone Harbour, approximately 0.8 km to the north east of the landfall location, is designated as a Ramsar Site, Site of Specific Scientific Interest, Special Area of Conservation and a Special Protection Area. The closest local nature reserve is the Kench, Hayling Island, approximately 1.4 km to the east.
- 2.2.13 There are three Scheduled Monuments in the vicinity of the landfall. These are Fort Cumberland directly to the east, Eastney Forts and Perimeter Defences of Barracks, directly to the west, and Eastney Sewage Pumping Station approximately 0.3 km to the north. There are a number of Listed Buildings surrounding the landfall and two within the indicative site boundary of land that may potentially be affected by the Proposed Development (the Grade II Listed World War II Anti-Tank Defences at Eastney Beach and World War II Pillbox at Eastney Beach).
- 2.2.14 The Portsmouth to South Hayling Coastal Path runs within the land potentially affected by the Proposed Development, starting from the west of the landfall. Eastney Beach is identified as a Site of Importance for Nature Conservation (SINC). It is located at the seafront and stretches from Langstone Harbour, westwards. Fort Cumberland SINC is located north of the Landfall site.
- 2.2.15 The closest Air Quality Management Area ('AQMA') is Portsmouth AQMA No. 9, approximately 1.4 km to the north of the landfall. The landfall is in an area of land classified as Flood Zone 3, so has a high probability of flooding.

2.3 French Onshore Components of AQUIND

- 2.3.1 The onshore components in France will be essentially identical to the components in the UK. The scheme will use identical technology and HVDC and fibre optic underground cables will be located within roads where possible. The four underground HVDC cables will run, typically within roads, for a distance of approximately 40km from landfall towards Grande Rue converter station.
- 2.3.2 The Grande Rue converter station will be located less than 2km from RTE's Barnabos substation and two 400kV HVAC cable circuits will run through fields and across any local roads between the two locations connecting into RTE's electrical system. In accordance with French legislation connection works between Grand Rue converter station and Barnabos substation will be performed by Réseau de Transport d'Électricité (RTE).

2.4 Subsea Cables in UK and French Waters

- 2.4.1 The four 320kV HVDC and fibre optic marine cables will run within the English Channel seabed for a distance of between approximately 180-185km.
- 2.4.2 The subsea cables are likely to have the following properties:
- Copper or Aluminium conductors with Cross-linked Polyethylene (XLPE) insulation; and
 - Lead sheathing to protect against water ingress and steel armouring to assist installation and protect against damage
 - Approximately 140 mm diameter and a weight of approximately 40 kg/m (in air) per cable. Aluminium cables may have larger diameters.

- 2.4.3 The subsea cables, typically, will be laid into shallow excavated trenches on the seafloor from cable laying vessels. The depth would be dependent on condition on the seafloor being conducive to meeting target cable burial depth. Ground conditions on some sections of the route might require an alternative protection method should trenching not be deemed suitable. The methodology of cable laying and subsequent cable laying configuration will be determined at the detailed design stage.

2.5 Proposed Development – UK Onshore

HVDC Power Converter Station – Lovedean Area

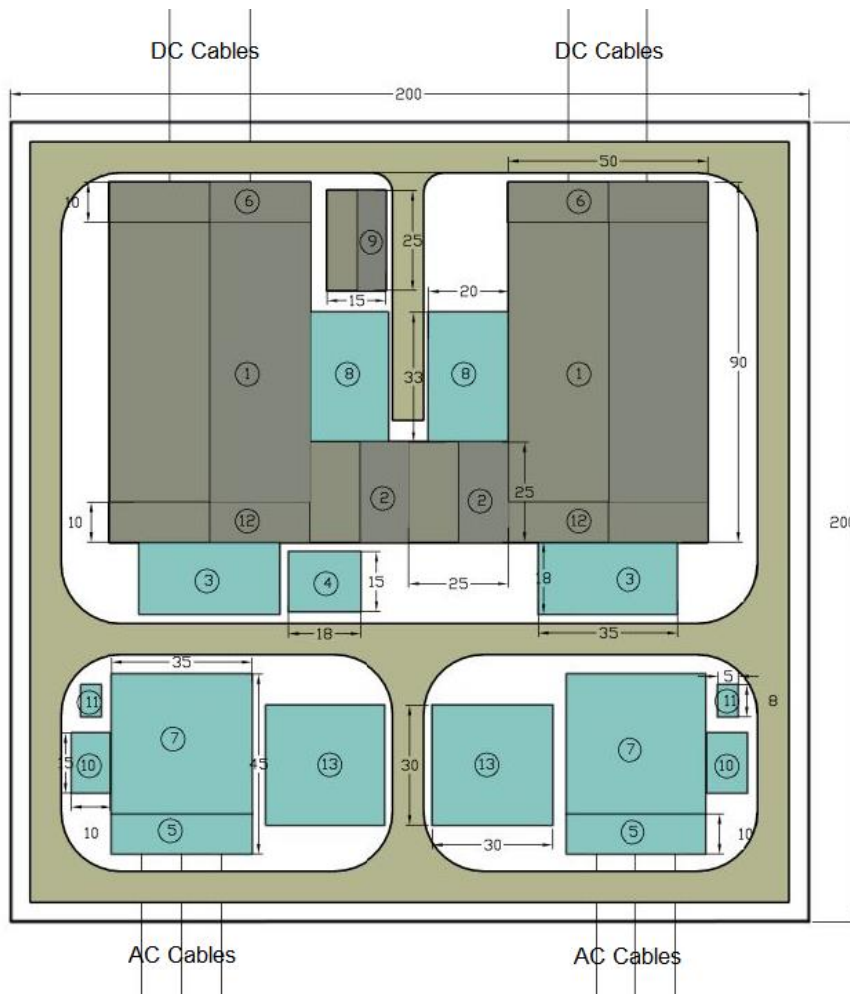
- 2.5.1 A typical layout for a converter station is illustrated in **Inset 2.2**. The proposed converter station will be situated within a security fenced area of between 200m x 200m and 300m x 300m. The exact configuration will depend on the technology provider selected to supply HVDC converter station equipment. The buildings will typically be constructed of steel frame and cladding.
- 2.5.2 An engineering optioneering process is ongoing to determine the most environmentally considerate option for location of the proposed converter station. Two site options, Option A and Option B are under consideration, both of which are located within the indicative site boundary as shown in **Figure 1.1**.
- 2.5.3 Landscaping will be implemented around the perimeter of the site to help integrate the proposed converter station into the surrounding environment. Given the topography of the area, grading of the land will also be required to level the construction platform.
- 2.5.4 A new permanent access road will be established from the existing road network at Broadway Lane or Old Mill Lane. Access via Broadway Lane, near where Broadway Lane intersects with Day Lane, is the preferred mode of access. This road will be used heavily throughout construction; however it will continue to be required for maintenance staff to access site. Access by maintenance staff will be limited to light vehicles. Occasional use by heavy vehicles will only be required for a major equipment failure, for example if the replacement of a transformer is needed at the proposed converter station.

Proposed Converter Station Design

- 2.5.5 The outdoor equipment which forms part of the proposed converter station will be similar to equipment that is found within typical electrical substations, such as National Grid's Lovedean substation. In addition, equipment is required to convert the power between AC and DC or vice versa. The equipment to convert power is a system of electronic valves housed within the proposed converter station buildings and has associated infrastructure for cooling and control.
- 2.5.6 With reference to proposed layout given in **Inset 2.2**, the electronic valves are housed within two converter hall buildings (1), each of which typically will measure 70m in length, 50m in width and 22m in height, but a lower building occupying a greater area may be considered if it proves technologically possible. An adjoining control building (2) will also be established however this will be at a reduced height. Depending on the detailed design, the building may be extended to include other equipment such as the AC reactors (12), and DC cable terminations (6); this is to prevent exposure to saline pollution. The lighting masts (height approximately 20m) 400kV switchyard (7), transformers (3) and filters (13) will be located outdoors. The converter station building may be located side by side or in a row. The exact shape of

the land plot occupied by the converter station will be finalised at the detailed design stage.

- 2.5.7 A temporary laydown area, to facilitate construction, would be required measuring approximately 1 - 2ha, however this land will be reinstated at demobilisation of the construction compound area.
- 2.5.8 The detailed design of the proposed converter station will be undertaken by an appointed Engineer, Procure, Construct (EPC) Contractor taking account of technical specification and site specific requirements. The detailed design would be approved through reserved matters applications.



SITE KEY		SITE KEY	
1	CONVERTOR HALL	8	VALVE COOLERS
2	CONTROL BUILDING	9	SPARES BUILDING
3	TRANSFORMERS	10	STANDBY GENERATOR
4	SPARE TRANSFORMER	11	AUXILIARY TRANSFORMER
5	AC CABLE TERMINATIONS	12	REACTORS
6	DC CABLE TERMINATIONS	13	FILTERS
7	400kV SWITCHYARD		

Inset 2.2: Typical Converter Station Layout

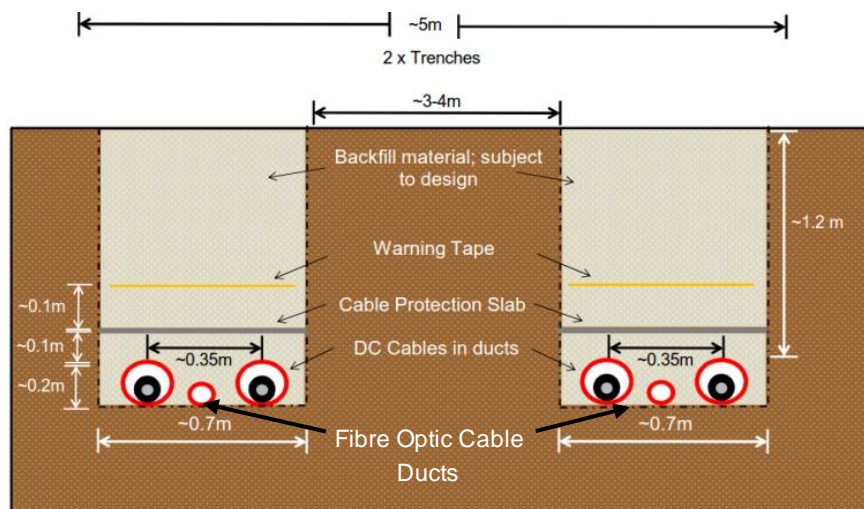
- 2.5.9 A technical specification will be developed during the procurement process which shall result in an EPC Contractor being appointed to construct the proposed

converter station. The technical specification will state that all equipment, buildings and infrastructure shall have a lifetime span of 40 years, which is common practice for this type of development, apart from electronic valves and control equipment which typically have a shorter lifespan and would be replaced earlier.

- 2.5.10 Works in the existing National Grid substation required to enable the connection to the proposed converter station will be undertaken within the existing security fence boundary, or any necessary extension, and will not form part of the Proposed Development.

Terrestrial Cables

- 2.5.11 The proposed terrestrial cable route from the converter station to the landfall will be approximately 18 km long. From the transition joint pit at the Eastney landfall, the cables will follow the A288, A2030, B2177, A3, B2150, local country roads and fields before terminating at the proposed converter station.
- 2.5.12 The four HVDC cables are to be installed in two separate pairs (where possible), mainly along the local roads, where there is enough space available for excavation, installation, stockpiles and access/egress of the equipment, service cars and construction plant. Where there is insufficient space in the road, the route will be diverted through an alternative road network or through fields.
- 2.5.13 Due to existing buried utility services at some locations, the cable trench arrangement will require modifications to accommodate the cables within local roads.
- 2.5.14 There are two locations along the cable route which will require Horizontal Directional Drilling (HDD). Where additional space is required for HDD crossings, adjacent fields will be utilised to facilitate the HDD construction works.
- 2.5.15 Each trench will also include a separate duct for the installation of fibre optic cables within the underground cable route.
- 2.5.16 **Inset 2.3** shows a typical cross-section of the HVDC cables. The cross section is subject to design and may change to navigate around underground infrastructure that may exist within the road or field.
- 2.5.17 The HVDC cables will be delivered to site within cable drums. Each cable drum will typically hold 500m to 1200m of cable. The joining of the cable together will be carried out within joint bays located underground in line, or off to one side of the cable route.



Inset 2.3: Typical Cross-Section of DC Cable Installation along Roads (NTS)

2.5.18 As shown in **Inset 2.3**, four cables (two separate pairs) will be installed in separate trenches (where possible), in flat formation. For construction within the road, the preferable construction process is to lay ducts in the excavated trenches and reinstate the road quickly. The HVDC cables will be pulled through the ducts from joint bay to joint bay at a later date. There may also be a smaller duct laid between the 2 HVDC cables for a fibre optic cable.

2.5.19 Each cable section will be defined by two joint bays at each end.

2.5.20 There may be occurrences where the cables will have to be laid / pulled in open trenches to be able to more precisely navigate around existing utility services or obstacles.

2.5.21 The majority of the route is expected to be navigated in the vicinity of the existing buried services. It is expected that the following services will be encountered throughout the route:

- Water main and distribution pipes;
- Drainage;
- Sewers;
- Gas main and distribution pipes;
- Electricity cables;
- Telecommunication cables;
- Street light power cables; and
- Traffic light power cables.

400kV HVAC cables

2.5.22 The 400kV HVAC cables will be laid between the proposed converter station and Lovedean substation. There will be two cable circuits, one connecting from each 1000MW converter to Lovedean substation. The design and configuration of the HVAC cables will be subject to detailed design and may be impacted upon by elements such as soil conditions, length of cable route, impact from the environment and existing infrastructure. This impact could require the cable circuits to be either 1 or 2 cables per phase (3 phases are required for each circuit), or the cable

configuration to be either laid flat (as shown **Inset 2.4**) or bundled close together in a trefoil format.

- 2.5.23 The HVAC cables will be delivered to site within cable drums. Each cable drum will typically hold 700m to 1000m of cable.
- 2.5.24 It is anticipated that a direct buried solution is possible along the entire HVAC cable route which is less than 2km, or alternatively, ducts could be laid with the cables pulled through at a later date. A decision on the installation method will be made by the installation contractor. The location of the route, existing site constraints, cable drum access into the fields, proximity to the existing overhead transmission lines and existing asset crossings will all determine the preferred method of installation.
- 2.5.25 The normal burial depth for direct buried cable across good agricultural land and open countryside is 900 mm to the top of the protection covers. The depth to the centreline of the cables will therefore be about 1300 mm. Where possible, a minimum buffer of 2m on either side of the cable trench to major tree roots.
- 2.5.26 Fibre optic cables will also be installed within a separate cable duct (not shown in **Inset 2.4**); this will facilitate communications and converter station control. An earth continuity conductor might be required alongside the HVAC cables (to be determined at detailed design stage).

2.6 Optioneering of the Proposed Development Proposed Converter Station

- 2.6.1 The Proposed Development is still undergoing different optioneering work. Currently there are two options being considered for the converter station location, these are described below. Only one option will be taken forward to the detailed design stage and therefore assessed in the EIA.

Converter Station Site Option A – South of Lovedean Substation

- 2.6.2 Site Option A is located to the south of the existing National Grid substation. Whilst the option benefits from being close to the existing access road (Broadway Lane), there are also some technical challenges in establishing a long cable connection to the National Grid substation. Moreover, also is likely to require 12 HVAC cables due to the existence of SSE 132kV oil filled cables which exit the existing substation to the South. Crossing the existing asset will in turn decrease the cable rating of the HVAC cables.

Converter Station Site Option B – West of Lovedean Substation

- 2.6.3 Site Option B is located to the West of the existing National Grid substation. This site benefits from the existing mature hedge lines which provide natural screening from South Downs Natural Park. Six HVAC cables will be required to establish the connection between the converter station and existing Lovedean substation. This option has also been reviewed against constructability criteria and the presence of the 400kV transmission line will constrain the access route to site which is longer than is proposed for Site Option A.

2.7 Construction and Installation

HVDC Converter Station

- 2.7.1 The construction of the proposed converter station would be undertaken over a period of approximately three years commencing in 2019, with the proposed converter station fully commissioned in 2022. Construction will likely include the activities summarised below.
- 2.7.2 The proposed converter station will be constructed within agricultural fields. Prior to the start of construction, respective ground/local environment inspections and surveys will be carried out to determine the nature of the soil and immediate area. This information will provide suitable data for the design and construction of temporary and permanent works as appropriate to meet the technical specification, required regulations and consent conditions.
- 2.7.3 The site selected for the proposed converter station is in close proximity to existing utility infrastructure which includes 400kV overhead lines (OHL) and underground cables. All design and construction works will be undertaken to ensure the existing infrastructure are not encroached in a manner that contravenes the utility owner's assets. Construction activities will be in accordance with recommended practise for safe working in proximity to OHL and underground cables.

Construction Laydown

- 2.7.4 When the appointed contractor mobilises there will be activities undertaken to secure the site within a perimeter fence with access controlled through a security gate and the setting up of the temporary laydown area which will include welfare facilities, vehicle parking, offices, equipment storage, local utility power and water supplies and spoil/rubbish containment.
- 2.7.5 The construction laydown area will encompass approximately 1 ha.

Earthworks

- 2.7.6 Cut and fill works would be used as required, to create a level site. Materials excavated on higher parts of the site would be used to fill lower levels in order to minimise material movement off site. Given the sensitive nature of the location, the option to increase the excavated material cut from the site to decrease the overall visual impact of the building will also be investigated.

Civil Engineering Works

- 2.7.7 The construction of building platforms, the development of the site's permanent drainage system and the construction of permanent access, internal roads within the proposed converter station and car parking arrangements would be completed prior to the construction of buildings on site.
- 2.7.8 The buildings will typically be constructed of steel frame and cladding. The design will also consider the sensitive location of the installation and look to limit the visual impact of the development where possible.

Terrestrial Cable Duct Installation

- 2.7.9 During construction work, there will be a variety of construction zones depending on the stage of work. The construction zone activities will cover the following:

- Excavation of the trench;
 - Installation of the ducts, or cable if direct buried option is used;
 - Installation of cable ducts using trenchless technique, if required;
 - Reinstatement of the final grade;
 - Construction of joint bay;
 - Cable drum area for pulling cable through ducts, or laid direct into open trench;
 - Cable winch area at the other end of the cable section;
 - Cable jointing work; and
 - Filling of ducts with grout (if applicable).
- 2.7.10 Where the cable route is in or immediately adjacent to roads, the installation will require traffic management, which will have to be agreed and approved by the relevant local authorities. Where possible, traffic will be diverted down one lane, whilst the adjacent lane is occupied for the construction of the cable circuit. This will limit the impact of the local community during cable installation works.
- 2.7.11 Cable duct installation will be optimised to keep road closures to a minimum.
- 2.7.12 It is likely that the underground cables will be pulled through pre-installed cable ducts in sections of between 500m and 1000m lengths, to minimise traffic disruption during installation. The cable ducts, made from plastic, will be installed in 20-30m sections.
- 2.7.13 Typically the duration to install 1km of ducts within roads, for two cable circuits would be approximately 2 weeks; however, this duration can be heavily dependent on the obstacles and utility services encountered within the road or constraints that need to be observed for a local authority or public considerations.
- 2.7.14 The cables will be routed to run in parallel or to cross over or under existing utility services. If the services are at 1m depth, or shallower, it is expected that the cables will cross underneath the service. It is possible for the cable to cross above the services however this requires the utility owner's agreement.
- 2.7.15 The ducts may, therefore, be diverted either towards the centre of the road (i.e. closer to the other pair of ducts installed on the opposite side of the road) or further from the verge towards private land.

Underground Cable Pulling, Jointing and Reinstatement

- 2.7.16 The underground cables will be transported on cable drums and this limits the length of cable which can be installed on one single span. It is envisaged that each cable drum will accommodate 1000m of cable. A complete section of between 500m - 1200m of ducting will be installed; the underground cables will be pulled through the ducts using cable pulling winches. This will therefore require joint bays to be positioned at 500-1200m intervals to complete the link to the proposed converter station. Joint bays will be positioned in verges, where possible, to limit any requirement for road closures.
- 2.7.17 Cable drums will hold the cable required to be pulled from one joint bay to the next, varying in length depending on the requirements of the route. The largest cable drum could weigh 70T and be 4m x 5m in dimension.
- 2.7.18 Delivering large cable drums will need planning and logistics for suitable routes, taking into account road/bridge load and restrictions in height and width, which may result in requiring shorter sections of cables.

- 2.7.19 Cable winches will pull the cable through the duct system. The winch line will be passed through the duct system of the section to be hooked on the cable pulling eye. The area of the winch will similarly be fenced out and designated as a construction zone.
- 2.7.20 Once cables are installed in all ducts, the joint bays will be partially backfilled and covered with steel plates for protection whilst awaiting further jointing operation.
- 2.7.21 Jointing of the cables will require the area of each joint bay to be fenced. Typically there would be one 40ft container for tools and equipment, a quiet generator and a temporary shelter installed over the joint pit. It typically takes 5 days to complete one joint bay location. Upon completion of the jointing, the site will be cleared and reinstated.
- 2.7.22 For cables that are installed within roads the location of cable joint bays will be determined by the contractor, and the emphasis will be given to an easy access and adequate room for placing a cable drum and/or a pulling winch. With that in mind, the joint bays are likely to be set on the verge of the roads.
- 2.7.23 In some locations the cable route may cross fields or other open land. The width of the temporary construction corridor, through fields, will cover for the requirement of construction traffic access across fields and alongside excavation works, including storing of excavated material.
- 2.7.24 The cable construction through fields requires either one of two construction methods, either the laying ducts for future cable pulling operations or a cable lay operation within an open cut trench. This will be subject to the cable system design.
- 2.7.25 Each excavated trench will be approximately 0.7m in width, shored at the sides, as necessary, to support the trench. Following laying of the duct/cable, the trench will be backfilled with a suitable material such as cement bound sand (to be confirmed by the designer). The trench will also include a protection slab above the ducts and buried warning tape.
- 2.7.26 Due to a much smaller diameter, fibre optics cables can be installed in longer segments. The installation of fibre optic cables will be performed at the same time with the electric cables.
- 2.7.27 Permanent easement along the entire route of the cable system will be required to allow future access for maintenance or cable repair works.

Terrestrial Cable – HDD Installation

- 2.7.28 Horizontal Directional Drilling will be used to allow cables to cross under large constraints such as railways, crossing of main roads and water ways. HDD could also be used to cross underneath other power cables or an area congested with utility services. HDD will also be used to install the marine cables in the intertidal area; this will be the method employed to pull the cables into the transition joint pit (TJP).
- 2.7.29 The HDD operations drill holes through the ground that will house ducts through which the cables will be pulled at a later date.
- 2.7.30 The HDD method limits disturbance to the environment and the related constraints that the cable is being diverted around.

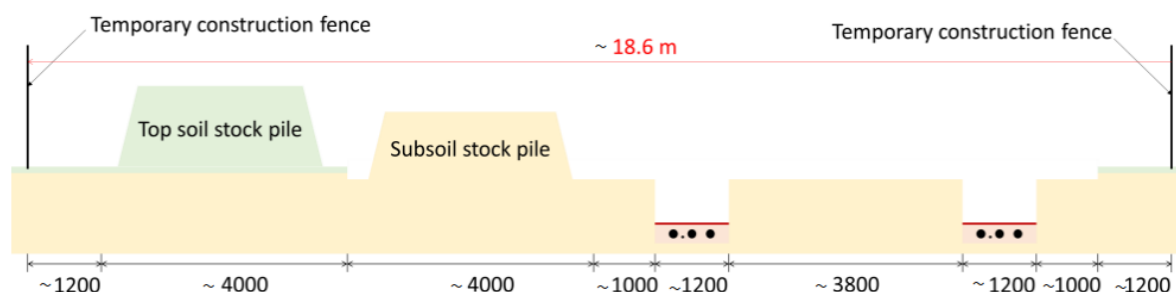
- 2.7.31 The HDD operations require a suitable space for the temporary construction area, which can be up to 50m x 50m depending on the length and size of the HDD works. The HDD operations require a working area to locate the drilling rig, generator, layout of ducts and construction equipment.

Eastney Transition Joint Bay Installation

- 2.7.32 The Transition Joint Bays (TJBs) will be excavated to a depth of approximately 1.5m to 3m and located at the end of the HDD exit point. The exact location of the proposed TJBs isare unknown at this stage. The TJB bay will be constructed with concrete floors, walls, backfilled with soil and sealed with a lid. At ground level it will be as original condition, subject to detailed design. The TJB dimensions will depend on a number of elements such as soil condition and cable design and typically one TJB may be 12m in length by 3m in width. The TJBs could be combined but will be subject to detailed design.

HVAC Cable Installation

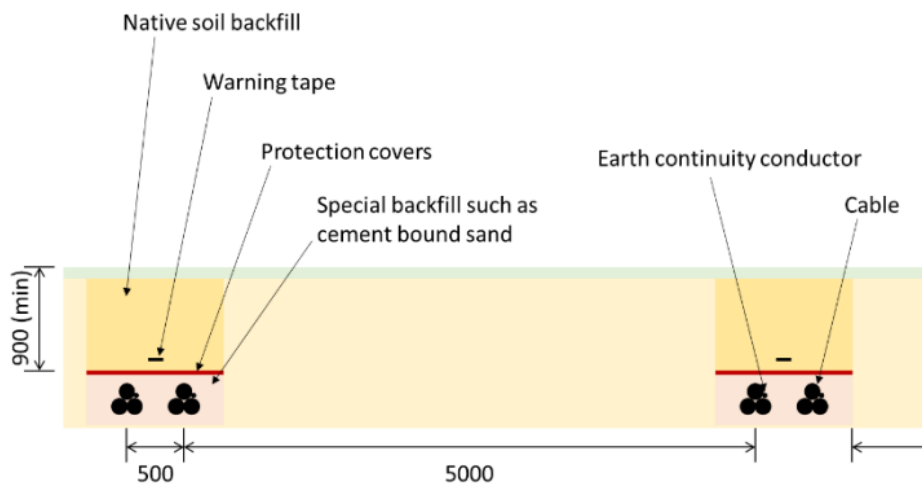
- 2.7.33 During construction works, an additional land area will be required for construction and laydown purposes. The length of cable route is anticipated to be less than 2km and for this short length it is not anticipated that a road (haul road) is required along the route to remove excavation spoil or provide access for the cable drum/large equipment. Space will be required at the excavation point for excavated material and this will generally be to the side of the route.
- 2.7.34 Additional laydown will be required for cable drum and accessory deliveries and temporary storage of cable laying plant. Assuming that cable and accessories are delivered to site as required a laydown area of 20m x 20m should be sufficient ideally this would be close to the converter station works.
- 2.7.35 **Inset 2.5** details a section through a typical construction corridor for the one cable per phase arrangement. The overall width between the temporary fences will be approximately 18m to 20m depending on the local environment and selection of cable design. It would be possible to reduce the width in places however this would require extra handling and a separate storage area for the excavated material. If the cable route length is increased then the haul road will be required and the construction corridor will be increased accordingly.



Inset 2.5: Proposed Cable Construction Corridor

- 2.7.36 The typical construction corridor for the two cables per phase arrangement (between the tempory fences) will also be approximately 18m to 20m, again, dependent on the

local environment and selection of cable design. Should 12 cables be required to facilitate the connection, they will be configured as shown in **Insert 2.6**.



Inset 2.6: Proposed Cable Arrangement (12 cables)

2.8 Operation and Maintenance

Operation:

2.8.1 The proposed converter station will be designed for unmanned operation, but a small team of maintenance staff (typically 3-4 in each country) will be responsible for maintaining the plant and will be on 24/7 callout if required.

Maintenance:

2.8.2 After approximately 15-20 years, the control system and proposed converter technology is normally updated and overhauled. This is a considerable investment but will ensure that the interconnector can operate efficiently throughout the remainder of its life.

2.8.3 Both the onshore and offshore cables will not require any maintenance however, unfortunately cable failures or damage to cables is not unusual, albeit rare in occurrence; onshore cable damage will typically leave the interconnector out of service for a couple of weeks during repair and offshore cable damage will typically take two months to repair, subject to vessel availability.

2.8.4 The availability of an interconnector is normally guaranteed by the manufacturer for a period of three to five years. Typically an HVDC interconnector will achieve an availability of 95-98%. The other 2-5% of the time the interconnector would be in an outage. Planned outages take place on an annual basis and usually last between 3-5 days. Unplanned outages occur when part of the interconnector fails, the majority of unplanned outages last for only a few hours but in the worst case (i.e. a cable fault) may take several weeks to be resolved.

2.9 Decommissioning

2.9.1 The Project will have a design life of 40 years with control system overhauls typically conducted every 15-20 years of operation. Major items of plant are designed to meet the lifetime of the scheme. If appropriate, the proposed converter station could be

decommissioned in accordance with the current re-cycling and waste disposal regulations. At the end of the cable's 40 year design, the options for decommissioning will be evaluated. In some instances, the least environmentally impacting option may be to leave the cable in-situ. The final decommissioning plan is still to be determined, and may depend on requirements and the marine environment at the time. When decommissioning the onshore cables, every effort would be made to recycle as much material as possible.

3 EIA Approach

3.5 Introduction

3.5.1 This section sets out the proposed approach to the EIA and provides an appraisal of the key environmental issues to be covered in the EIA (i.e. “scoped in”) and the issues not requiring further consideration (i.e. “scoped out”) in the context of the key legislative and policy documents. It outlines the approach to the EIA process, including:

- Identifying the approach to the assessment of environmental effects;
- The significance criteria which will be used within the EIA;
- The level of information required for the EIA and proposed structure of the ES; and
- Proposed consultation.

Legislative Compliance

3.5.2 The EIA will be undertaken in accordance with the EIA Regulations and current best practice guidance, including the NPPG document ‘Environmental Impact Assessment’ (2014) and the following:

- Department for Communities and Local Government (DCLG) 2006 - Amended Circular on Environmental Impact Assessment: A Consultation Paper, June 2006;
- DCLG 2006 – Environmental Impact Assessment: A Guide to Good Practice and Procedures: A Consultation Paper;
- Institute of Environmental Management and Assessment (IEMA) (2017) - Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice; and
- IEMA (2016) - Environmental Impact Assessment Guide to: Delivering Quality Development.

3.5.3 Legislation, policy or guidance which relates to a specific technical discipline will be considered as appropriate and discussed within the relevant technical chapters of the ES.

3.5.4 The ES will report the likely significant environmental effects as a result of the Proposed Development, and where such effects are identified, recommend mitigation measures to prevent, reduce or remedy the effects. In addition, enhancement opportunities will be identified to optimise the benefits and positive aspects of the Proposed Development which may form inherent mitigation in the Application Plans to be submitted for approval to support the planning application.

3.5.5 The ES will review and provide all the environmental issues identified in Schedule 4 of the EIA Regulations as is reasonably required to assess the likely environmental effects of the development.

3.5.6 A detailed description of the Proposed Development as per supporting Application Plans will be provided within the ES with sufficient information about the site, design, size and scale of the development such that the LPAs can reasonably be satisfied that it has sufficient information for determination in full knowledge of the proposal's likely significant effects on the environment.

3.5.7 Further information on relevant legislation can be found in **Appendix 3**.

3.6 Baseline Assumptions

- 3.6.1 For the purposes of the EIA and all technical assessments, the baseline scenario (against which any likely significant effects will be assessed) will be taken to be the Site as it currently stands.

3.7 Potential Environmental Effects

- 3.7.1 The Applicant is committed to ensuring that likely significant environmental effects from the Proposed Development are identified and where possible addressed through the design process before the Application Plans to support the planning application for submission are fixed. The environmental specialists will therefore work with the design team to avoid or offset any likely significant effects through early design reviews and revisions to the Proposed Development to optimise the scheme shown on the Application Plans to support the planning application.
- 3.7.2 The potential sensitive receptors likely to be significantly affected by the Proposed Development will be identified based on desktop studies, site visits and surveys as well as from existing knowledge and understanding. This provides a comprehensive environmental dataset of potential sensitive receptors, see **Table 3.1**. The sensitive receptors will be identified in more detail in the technical chapters.

Table 3.1: Potential Existing Sensitive Receptors

RECEPTORS	DESCRIPTION
Transport Network	Existing sensitive receptors comprise: <ul style="list-style-type: none"> • Local highway network; • Existing users of the highway; • Network of footway and pedestrian connections that serve the Site; • Public Rights of Way (PRoW); and • Cycle routes.
Ecological Receptors such as fauna and flora	Effect of construction works on existing habitats within the Site. Based on the extended Phase 1 Habitat Survey and ecological desk study, the following potential ecological receptors have been identified: <p>Protected areas such as Special Protection Areas and Special Areas of Conservation;</p> <p>Protected species such as bats, dormouse, breeding birds and great crested newts.</p>
Heritage assets, including archaeological, heritage and landscape features	There are Listed Buildings and Scheduled Monuments within the vicinity of the Site.
Hydrological Receptors	Effects on water resources including ground water and surface water provision.
Residential and Commercial development	Presence and disturbance of any contaminated ground and hazardous materials and associated effects as a result of demolition and construction including potential effects on groundwater; and <p>Existing surrounding residential and commercial properties.</p>

3.8 Proposed Scope of the EIA

3.8.1 In the context of the above, the construction and operation of the Proposed Development may lead to significant environmental effects on the following parameters, although effects could be limited in their temporal and geographical scope:

- Traffic and Transport;
- Air Quality;
- Noise and Vibration;
- Landscape and Visual;
- Heritage and Archaeology;
- Ecology (with Arboriculture);
- Socio-economics;
- Water Resources and Flood Risk;
- Ground Conditions;
- Carbon and Climate Change;
- Human Health;
- Soils and Land Use;
- Electric and Magnetic Fields; and
- Waste and Material Resources.

3.8.2 **Sections 5-18** of this Scoping Report set out the proposed scope and methodology for the identified parameters for assessing the likely significant environmental effects of the construction and operational stages of the Proposed Development. The scope of the EIA is summarised in **Appendix 1**.

3.9 Assessment of the Proposed Development

3.9.1 The assessment will consider the likely significant environmental effects of the Proposed Development at the site preparation and construction and operational stages. The definitions of these are presented below:

- **Site Preparation and Construction:** Site preparation includes work required to prepare the Site for construction including demolition, earthworks, remediation (if required) and any archaeological excavation. The construction stage includes all works associated with construction. It is known that the construction of the development will extend over a number of years. Therefore, where feasible and where sufficient information exists, construction effects identified within the ES will be time bound and location specific; and
- **Operation:** This relates to effects once the development is constructed and in use or occupied.

3.9.2 Information relating to the above development phasing will not be applicable to the assessment process for all technical disciplines. For example, Traffic and Transport will be based on baseline year, operating year and years subsequent to this, in accordance with relevant standards and assessment guidelines. At this stage a number of design details are still emerging, including the phasing, demolition, and construction programme. Details of the phasing, demolition, and construction of the Proposed Development will be included within the ES, including an opening year which will be referenced consistently throughout each of the technical chapters within the ES.

- 3.9.3 Each technical discipline will consider and assess effects considering the geographical extent of any given effect. For example, species movement cannot be confined to definitive boundaries and needs to be assessed based on the movement patterns of those individual species concerned.
- 3.9.4 The assessments of the likely significant effects for each discipline will take into account both the construction and operational stages of the Proposed Development as a whole, however the assessments will not consider specific build out phases of each stage.
- 3.9.5 A number of criteria will be used to determine whether or not the potential effects of the Proposed Development are 'significant'. The effects will be assessed quantitatively wherever possible. The significance rating will take account of the following criteria:
- Likelihood of occurrence;
 - Geographical extent;
 - Adherence of the proposals to legislation and planning policy;
 - Adherence of the proposals to international, national and local standards;
 - Sensitivity of the receiving environment or other receptor;
 - Value of the affected resource;
 - Whether the effect is temporary or permanent;
 - Whether the effect is short, medium, or long-term in duration;
 - Whether the effect is reversible or irreversible;
 - Inter-relationship between effects (both cumulatively and in terms of potential effect interactions); and
 - The consultation responses.
- 3.9.6 The effects that are considered to be significant, prior to mitigation, will be identified in the ES. The significance of effects reflects judgements as to the importance or sensitivity of the affected receptor(s) and the nature and magnitude of the predicted changes. For example, a large negative effect on a feature or site of low importance will be of a lesser significance than the same effect of a feature or site of high importance.
- 3.9.7 In determining the significance of a potential effect, the magnitude of change arising from the proposal is correlated with the 'sensitivity' of the particular environmental attribute under consideration. Sensitivity is assigned at the receptor level, and as such details will be provided within the receptor specific assessments presented in the ES.
- 3.9.8 The following terms will be used in the ES, unless otherwise stated within individual chapters, to determine the significance of effects:
- 3.9.9 **Major positive or negative effect** – where the Proposed Development would cause a large improvement (or deterioration) to the existing environment which will likely (but not exclusively) feature nationally or internationally important assets;
- 3.9.10 **Major/Moderate positive or negative effect** – where the Proposed Development would cause a noticeable improvement (or deterioration) to the existing environment at a national or regional scale;
- 3.9.11 **Moderate positive or negative effect** – where the Proposed Development would cause a noticeable improvement (or deterioration) to the existing environment at a local scale;

- 3.9.12 **Minor positive or negative effect** – where the Proposed Development would cause a small improvement (or deterioration) to the existing environment at a local scale; and
- 3.9.13 **Negligible** – no discernible improvement or deterioration to the existing environment as a result of the Proposed Development will occur.
- 3.9.14 Although significance is usually assessed in terms of varying degrees, those effects indicated as 'major' and 'moderate/major' are likely to be regarded as being equivalent to 'significant effects' when considered against of Guidelines for Environmental Impact Assessment (2004): Institute of Environmental Management and Assessment (IEMA). In addition, 'moderate' impacts may constitute 'significant effects'. Whether they do so shall be determined by a qualitative analysis of the specific impact to the environment that is identified. Following the iterative design process identified earlier, the significance of each effect would be confirmed or reassessed.
- 3.9.15 The significance of the effect may also need to be qualified with respect to the international, national, regional or local scale over which it may be felt. The significance of an effect may also be affected by its duration (e.g. the length of the installation period) and by its reversibility, i.e. the degree to which a site could be returned to its baseline conditions following decommissioning.
- 3.9.16 As detailed above, the significance of effects reflects judgements as to the importance or sensitivity of the affected receptor(s) and the nature and magnitude of the predicted changes.
- 3.9.17 The magnitude relates to the level at which the receptor will be impacted, using the duration of the impact, timing, scale, size and frequency to determine the magnitude of the impact to each receptor. The magnitude of change is evaluated in accordance with the definitions set out in **Table 3.2** below. The definitions of magnitude in **Table 3.2** should be used as a guide only and may be more specific for some receptors (e.g. marine mammals).

Table 3.2 Definitions of 'magnitude' of effect

MAGNITUDE OF EFFECT	DEFINITION
High	Total loss or major alteration to key elements/features of the baseline (i.e. pre-development) conditions.
Medium	Partial loss or alteration to one or more key elements/features of the baseline (i.e. pre-development) conditions.
Low	Minor shift away from baseline (i.e. pre-development) conditions.
Negligible	Very slight change from baseline (i.e. pre-development) conditions.

- 3.9.18 For the purpose of carrying out the assessment a scale of increasing 'sensitivity' of the environmental or human receptor is also defined. This may be defined in terms of quality, value, rarity or importance, and be classed as low, medium, or high. For certain assessment areas, guidance can be taken from value attributed to elements through designation or protection under law, e.g. ecological resources given various levels of protection under law.
- 3.9.19 Where an assessment of this nature takes place, the correlation of magnitude against sensitivity determines a qualitative expression for the significance of the effect, which determines the relevance of the effects to the terms that will be used in the ES to assess significance stated earlier in this paragraph. This is demonstrated in **Table 3.3**.

Table 3.3 Matrix for determining the significance of effects

		SENSITIVITY OF RECEPTOR / RECEIVING ENVIRONMENT TO CHANGE			
		High	Medium	Low	Negligible
Magnitude of Change	High	Major	Major to Moderate	Moderate	Negligible
	Medium	Major to Moderate	Moderate	Minor to Moderate	Negligible
	Low	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

3.9.20 Best practice and guidance requires that certain technical topics are required to follow topic-specific criteria for determining significance. Where this is the case, the criteria to be used will be presented clearly in the EIA methodology section of the ES or where appropriate, within technical chapters within the ES.

3.10 Consideration of Main Alternatives

3.10.1 The EIA Regulations require that the ES contains ‘...a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studies by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects’ (Schedule 4).

3.10.2 Accordingly the ES will contain a description of the alternatives to the Proposed Development that were reasonably considered by the Applicant prior to selection of the final Proposed Development. A summary will be provided of the reasons for selection of the final development design, taking into account environmental considerations. The ES will include a description of the design alternatives considered as part of the design process. The ES will also consider alternative site locations for the Proposed Development.

3.11 Assessment of Cumulative Effects

3.11.1 The EIA Regulations require the likely significant cumulative environmental effects of a development with other existing and/or approved projects to be considered. Consideration will be given to the potential cumulative effects of the Proposed Development in combination with other committed developments in the locality.

3.11.2 The technical assessments for each discipline will consider the potential for cumulative or in-combination effects (at receptor level). Cumulative effects will be considered in terms of:

- Intra-project effects: The interaction and combination of environmental effects, and indirect effects of the Proposed Development affecting the same receptor, either within the Site or in the local area; and
- Inter-project effects: The interaction and combination of environmental effects of the Proposed Development with committed projects and activities affecting the same receptor. Committed development is defined as development for which planning consent has been granted or in some instances may include foreseeable development currently under planning determination.

- 3.11.3 Guidance indicates that a cumulative effects assessment should only consider those schemes that can reasonably be presumed to go ahead and for which sufficient information is available.
- 3.11.4 The projects which are to be considered in cummulation with the Proposed Development as part of the EIA are those located within a 1km radius of the Proposed Development that have the benefit of planning permission, or are reasonably foreseeable (i.e. resolution to grant) and are similar in terms of use, scale and nature. The schemes which meet these criteria are set out in **Table 3.4** and their locations are shown on **Figure 3.1**.
- 3.11.5 There is no single widely accepted published methodology for the assessment of cumulative environment effects. However, a number of best practice guidance documents are available, including those published by DCLG and the European Commission and these will be referred to during the completion of this element of the ES. The 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions' provides the following guidance on cumulative effects.
- *'In practical terms, the extent of the assessment in terms of how far into the past and into the future will be dependent upon the availability and quality of information...';*
 - *'...it is only reasonable to consider current events and those that will take place in the foreseeable future. Furthermore, the assessment can only be based on the data that is readily available'*
- 3.11.6 The guidance above identifies that a cumulative effects assessment should only consider those schemes that can reasonably be presumed to go ahead and for which sufficient information is available. This is usually taken to be those schemes that have a benefit of Planning Permission as identified on the LPAs Planning Application Register.
- 3.11.7 Cumulative effects will be identified and assessed through a desk based study using professional expertise to make a judgement as to the likely significance of changes in baseline conditions in the area surrounding the Site arising from the completion of the Proposed Development together with relevant committed developments. A quantitative assessment approach will be adopted where appropriate and possible, and where data is available. Consideration will be given to the timing and spatial influence of the Proposed Development and the identified committed developments.
- 3.11.8 The result of the cumulative effects will be provided in the ES which will summarise the interactions between effects (as assessed in the individual chapters for each topic) and will describe the findings of the assessment of cumulative effects arising from the combination of the development together with relevant committed developments in the locality.
- 3.11.9 It would be appreciated if the LPAs could please confirm within their formal EIA Scoping Opinion the committed or permitted schemes that they believe should be included as part of any cumulative assessment.
- 3.11.10 The key potential cumulative effects for consideration in the ES are expected to include the following:
- Road traffic generation during construction and operation; and
 - Effect on landscape character, including built heritage assets and their setting and visual amenity.

- 3.11.11 The assessment of interaction between effects that may occur between different environmental components (such as air, noise and road traffic) will be inherent within the EIA process and will be presented in the ES chapter specific to each topic, with cross references made between topics where appropriate.
- 3.11.12 The traffic assessment and traffic data utilised for the assessment will include the predicted future traffic generation on the local highway network (including relevant committed developments within the local area).

Table 3.4: Proposed Committed Developments within East Hampshire District Councils Boundary

DEVELOPMENT ADDRESS	PLANNING APPLICATION REFERENCE	DESCRIPTION	APPROXIMATE DISTANCE FROM SITE	LOCAL PLANNING AUTHORITY	STATUS AS OF DECEMBER 2017
Land south of Lovedean Electricity Sub Station, Broadway Lane, Lovedean, Waterlooville	57524/001	Installation of two energy storage systems and associated infrastructure with a total capacity of 49.95MW.	To the immediate south of Lovedean substation.	East Hampshire District Council	Awaiting decision
Land rear of 185-189A Lovedean Lane	54596/001	Outline application with some matters reserved for 40 residential dwellings (mix of 1, 2, 3 and 4 bed) with associated amenity space and road network with access from Lovedean Lane via existing access.	1.1km to the south east of the proposed converter station	East Hampshire District Council	Outline permission granted on 15.09.2014.
Land Rear of 179-189A Lovedean Lane, Horndean, Waterlooville	54596/002	Reserved matters pursuant to 54596/001 for dwellings and discharge of condition 7 of 54596/001 as revised by plans and details received 3 March 2016.	1.1km to the south east of the proposed converter station	East Hampshire District Council	Reserved matters granted on 29.04.2016
Development Land East of Horndean, Rowlands Castle Road, Horndean, Waterlooville	55562/001	Outline planning application with all matters reserved (except for access to the highway network and associated off-site highway improvements) for the demolition of existing buildings and the development of a maximum of 700 dwellings, approximately 1.7 Ha of employment land, a Local Centre (including local retail, a primary school and community facilities), a Care Village, playing pitches, a cricket pavilion (including associated access and parking), allotments (including associated building and car parking), acoustic bunds and ecological buffers together with internal access network (including footpaths and cycleways), drainage works, associated landscaping and open space (including play areas).	35km east of the proposed converter station	East Hampshire District Council	Outline permission granted on 05.02.2016

Table 3.5: Proposed Committed Developments within Havant Borough Councils Boundary

DEVELOPMENT ADDRESS	PLANNING APPLICATION REFERENCE	DESCRIPTION	APPROXIMATE DISTANCE FROM SITE	LOCAL PLANNING AUTHORITY	STATUS AS OF DECEMBER 2017
Former Purbrook Park Playing Fields, Stakes Road, Waterlooville	APP/12/00205	Construction of 76No. dwellings consisting of 3No. 2 bed, 38No. 3 bed, 23No. 4 bed houses and 12No. 2 bed flats with associated parking, landscaping including open space and play area, and pumping station. New vehicular access to Stakes Road and new pedestrian access to Stakes Hill Road.	0.52km to the east of the cable route	Havant Borough Council	Permission granted on 03.08.2012
Purbrook Park School, Park Avenue, Waterlooville, PO7 5DS	APP/14/00687	Construction of new two storey school building (Block A), two storey school building to courtyard (Block B), refurbishment to Block D, raised covered walkways, new pedestrian access to main entrance and new Block A, altered and additional car parking, landscaping and other works. Demolition of two storey Caretakers house (approved 16/10/2014). Request to Discharge Conditions 3 and 4 (09.03.2016). Request to Discharge Conditions 2 and 16 (26.8.16).	0.54km to the east of the cable route	Havant Borough Council	Under construction
Grainger Development Site Land West of, London Road, Waterlooville	APP/10/00828	Outline application for the development of approx 2,550 no. dwellings including the construction of a new access from Ladybridge Roundabout, Milk Lane and completion of Maurepas Way access, a local centre (comprising retail, community building, land for health care, land for elderly care) public house, land for 2 primary schools, land for a nursery, land for employment uses, associated amenity space along with substantial green infrastructure, SuDS, land for allotments, main pumping station, land for cemetery, restoration of River Wallington, together with landscape structure planting (Matters for Approval Access only). Full planning application for the development of Phase 1 comprising 194 no. dwellings, internal roads, garages, driveways, pathways, boundary treatment, substation, pedestrian/cycle ways, including to Maurepas Way, associated parking spaces, flood attenuation ponds, temporary play provision, associated amenity space and hard and soft landscape works. Full planning for engineering operations associated with infrastructure	0.26 km to the west of the cable route	Havant Borough Council and Winchester City Council	Permission granted on 18.04.2012

DEVELOPMENT ADDRESS	PLANNING APPLICATION REFERENCE	DESCRIPTION	APPROXIMATE DISTANCE FROM SITE	LOCAL PLANNING AUTHORITY	STATUS AS OF DECEMBER 2017
		requirements and service provision for the detailed Phase 1 application, the temporary closure of Havant Footpath No 11 and Southwick and Widley Footpath No 30, with suitable alternative route provided (approved 18/04/2012). Request to Discharge Conditions 6(ii) (a, (d, (e, (f, (i, (l, 11 and 18 (09/12/2016). Request to discharge condition No.6 (11) (o) (18.04.17). Request to Discharge Condition 6 (ii) o) (23.05.17).			

Table 3.6: Proposed Committed Developments within Winchester City Councils Boundary

DEVELOPMENT ADDRESS	PLANNING APPLICATION REFERENCE	DESCRIPTION	APPROXIMATE DISTANCE FROM SITE	LOCAL PLANNING AUTHORITY	STATUS AS OF DECEMBER 2017
Grainger Development Site Land West of, London Road, Waterlooville	APP/10/00828	Outline application for the development of approx 2,550 no. dwellings including the construction of a new access from Ladybridge Roundabout, Milk Lane and completion of Maurepas Way access, a local centre (comprising retail, community building, land for health care, land for elderly care) public house, land for 2 primary schools, land for a nursery, land for employment uses, associated amenity space along with substantial green infrastructure, SuDS, land for allotments, main pumping station, land for cemetery, restoration of River Wallington, together with landscape structure planting (Matters for Approval Access only). Full planning application for the development of Phase 1 comprising 194 no. dwellings, internal roads, garages, driveways, pathways, boundary treatment, substation, pedestrian/cycle ways, including to Maurepas Way, associated parking spaces, flood attenuation ponds, temporary play provision, associated amenity space and hard and soft landscape works. Full planning for engineering operations associated with infrastructure requirements and service provision for the detailed	0.26 km to the west of the cable route	Havant Borough Council and Winchester City Council	Permission granted on 18.04.2012

DEVELOPMENT ADDRESS	PLANNING APPLICATION REFERENCE	DESCRIPTION	APPROXIMATE DISTANCE FROM SITE	LOCAL PLANNING AUTHORITY	STATUS AS OF DECEMBER 2017
		Phase 1 application, the temporary closure of Havant Footpath No 11 and Southwick and Widley Footpath No 30, with suitable alternative route provided (approved 18/04/2012). Request to Discharge Conditions 6(ii) (a, (d, (e, (f, (i, l, 11 and 18 (09/12/2016). Request to discharge condition No.6 (11) (o) (18.04.17). Request to Discharge Condition 6 (ii) o) (23.05.17).			
Land At Old Park Farm Wimpey Site Part Of West Of Waterlooville MDA Hambledon Road Denmead Hampshire	13/02843/FUL	(AMENDED PLANS) Residential development comprising 103 no. dwellings with associated on-site infrastructure.	0.3km to the west of the cable route	Winchester City Council	Application permitted 31.07.2015

Table 3.7: Proposed Committed Developments within Portsmouth City Councils Boundary

DEVELOPMENT ADDRESS	PLANNING APPLICATION REFERENCE	DESCRIPTION	APPROXIMATE DISTANCE FROM SITE	LOCAL PLANNING AUTHORITY	STATUS AS OF DECEMBER 2017
Coastline Between Ports Creek Railway Bridge And Kendall's Wharf Portsmouth PO3 5LY	14/01387/FUL	Construction of new coastal defences consisting of raised earth embankments with rock armour on the seaward side, together with wave walls to abut the A2030 Eastern Road bridge to tie into the new embankments (along the alignment of the existing coastal defences), and associated landscaped works including a shared footpath constructed along the full length of the new embankment.	0.15km to the east of the cable route	Portsmouth City Council	Under construction
Coastal Defences Fort Cumberland Fort Cumberland Road Southsea PO4 9LJ	16/00255/FUL	Replacement of existing coastal sea defences with a rock revetment.	0.2 km to the east of the landfall	Portsmouth City Council	Under construction
West Wing St. Marys Hospital Milton Road Portsmouth PO3 6AD	11/00250/OUT	Construction of 2- and 3- storey buildings comprising 191 dwellings and a 2-storey 60 bed care home with associated estate roads/parking areas/open space and landscaping after demolition of existing buildings	0.29km to the west of the cable route	Portsmouth City Council	Conditional outline permission granted 29.03.2012

DEVELOPMENT ADDRESS	PLANNING APPLICATION REFERENCE	DESCRIPTION	APPROXIMATE DISTANCE FROM SITE	LOCAL PLANNING AUTHORITY	STATUS AS OF DECEMBER 2017
		[Outline with all matters reserved].			
Tesco Fratton Way Southsea PO4 8FA	14/00128/FUL	Construction of a Retail Store (Use Class A1) of up to 10,475sqm GEA, Petrol Filling Station (Sui Generis) with an associated kiosk up to 86sqm GEA, canopy and jet wash, new access/egress arrangements, car parking including replacement Stadium car parking, service yard, highway and footpath works, landscaping, and other associated works (after demolition of existing structures).	0.5km to the west of the cable route	Portsmouth City Council	Conditional permission granted on 19.09.2014
Former Kingston Prison Milton Road Portsmouth PO3 6AS	16/00085/FUL	Redevelopment of former prison comprising: part demolition and conversion of listed buildings to provide 73 dwellings and commercial unit (within Class A1 or Class A3); demolition of non-listed structures; construction of five blocks of between three and seven stories to provide 157 dwellings; part demolition of listed prison wall and formation of new vehicular accesses to Milton Road and St Marys Road; and provision of car parking and associated landscaping and other works.	0.67km to the west of the cable route	Portsmouth City Council	Conditional permission granted on 02.02.2017
Voyager Park Portfield Road Portsmouth PO3 5FJ	11/00822/VOC	Application to renew planning permission A*36229/AH to extend period of implementation for the development of site for offices/ industrial/ warehousing/ distribution (Classes B1, B2 and B8).	0.96km to the west of the cable route	Portsmouth City Council	Conditional outline permission granted on 24.11.2011

3.12 Approach to Mitigation Measures

- 3.12.1 Good practice dictates that the EIA process should influence the location and basic design of a development in order to limit adverse effects on receptors and this should be reported in the ES. Environmental effects which cannot be avoided or mitigated through careful design will be assessed to determine their significance and where required mitigation will be recommended for both development scenarios (construction and operation).
- 3.12.2 The mitigation measures/ enhancement measures reported within the ES chapters will be identified and may be secured through planning conditions and/or planning obligations.

3.13 EIA Consultation

- 3.13.1 Under the terms of Regulation 15(4) the local planning authority is asked to consult with at least the consultation bodies identified in Regulation 2(1) of the EIA Regulations, including Historic England, Natural England and the Environment Agency before issuing their Scoping Opinion to enable the above organisation to provide their input into the formal Scoping process.
- 3.13.2 Consultation with both statutory and non-statutory consultees will be undertaken in future stages of the EIA. Initially, this Scoping Report will provide the basis for consultation on the nature of the Proposed Development, its potential environmental effects, and the scope and methodology proposed for the EIA. To this end, the LPAs are expected to, on receipt of this Scoping Report:
- ‘Notify the consultation bodies in writing of the name and address of the person who intends to submit an Environment Statement and of the duty imposed on the consultation bodies by paragraph (4) to make information available to that person; and inform in writing the person who intend to submit an Environmental Statement of the names and addresses of the bodies to be notified.’*
- 3.13.3 At this stage, it is envisaged that, as a minimum, the following consultation bodies will be notified:

- LPA Officers:
 - Archaeology Officer,
 - Conservation and Design Team,
 - Biodiversity Officer,
 - Environmental Protection Team [Noise / Air Quality / Land Contamination],
 - Planning Policy,
 - Transport Planning Team;
- Highways England;
- Environment Agency;
- Historic England;
- Natural England; and
- National Trust.

4 Planning Context

4.1 Introduction

- 4.1.1 This section provides a summary of the relevant planning policies associated with the Proposed Development. The Proposed Development will be reviewed against these policies and the analysis will subsequently inform the ES and other documents which will form part of the planning applications.
- 4.1.2 The Proposed Development will require planning permission from East Hampshire District Council, Winchester City Council, Havant Borough Council and Portsmouth City Council, with the individual elements of the scheme being located in the authority areas as summarised in **Table 1.1**.
- 4.1.3 The planning framework against which the Proposed Development will be assessed comprises the following:
- National Planning Policy Framework;
 - National Planning Practice Guidance;
 - Local Development Plans;
 - Relevant National Policy Statements (NPS):
 - NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) (now Department for Business, Energy and Industrial Strategy (BEIS)), 2011); and
 - NPS Electricity Networks Infrastructure (EN-5) (DECC, 2011).

4.2 National Policy

National Planning Policy Framework

- 4.2.1 The NPPF was adopted in March 2012, replacing the majority of Planning Policy Statements and Planning Policy Guidance Notes. The NPPF sets out the Government's planning policies for England and how these are to be applied. It is a material consideration in planning decisions. The policies contained within the NPPF are expanded upon and NPPG, which was published in March 2014.
- 4.2.2 The NPPF is built on the concept of sustainable development and identifies that the purpose of the planning system is to contribute to this. According to paragraph 14, at the heart of the NPPF is a presumption in favour of sustainable development, which should be seen as a golden thread running through decision-taking. Paragraph 14 also states that for decision makers the presumption in favour means that where proposals accord with the Development Plan, they should be "approved without delay". This is also stated in Section 38(6) of the Planning and Compulsory Purchase Act 2004, which places a statutory duty on local planning authorities to determine planning applications in accordance with the Development Plan unless material planning considerations indicate otherwise.
- 4.2.3 The NPPF sets out 13 key areas in which the planning system should promote sustainable development. The most relevant to the Proposed Development include:
- Section 4: Promoting Sustainable Transport;
 - Section 7: Requiring Good Design;
 - Section 8: Promoting Healthy Communities;

- Section 10: Meeting the Challenge of Climate Change, Flooding and Coastal Change;
- Section 11: Conserving and Enhancing the Natural Environment; and
- Section 12: Conserving and Enhancing the Historic Environment.

4.2.4 The ES and supporting documents including the Planning Statement will include assessments of the Proposed Development against the relevant chapters of the NPPF as set out above.

National Planning Policy Guidance

4.2.5 The NPPG was issued in March 2014 and provides guidance on how planning policies are to be applied to development proposals. The most relevant guidance which will inform the production of the ES include:

- Air Quality (March 2014);
- Climate Change (June 2014);
- Conserving and Enhancing the Historic Environment (April 2014);
- Design (March 2014);
- Environmental Impact Assessment (July 2017);
- Flood Risk and Coastal Change (March 2014);
- Health and Wellbeing (July 2017);
- Land Affected by Contamination (June 2014);
- Light Pollution (March 2014);
- Natural Environment (January 2016);
- Noise (March 2014);
- Open Space, Sports and Recreation facilities, Public Rights of Way and Local Green Space (March 2014);
- Renewable and Low Carbon Energy (June 2015);
- Travel Plans, Transport Assessments and Transport Statements (March 2014);
- Tree Preservation Orders and Trees in Conservation Areas (March 2014);
- Waste (October 2015); and
- Water Supply, Waste Water and Water Quality (March 2015).

National Policy Statements

4.2.6 The DECC (now BEIS) published a number of NPSs in relation to energy infrastructure, which were designated by the Secretary of State for Energy and Climate Change in July 2011. NPSs are a material consideration when determining major infrastructure applications, including those which fall under the Town and Country Planning Act 1990 (as amended).

4.2.7 NPSs include the Government's objectives for the development of nationally significant infrastructure in a particular infrastructure sector (e.g. energy). They state how the development of nationally significant infrastructure will contribute to sustainable development; how the objectives contained within the NPSs have been integrated with other Government policies; and how actual and projected capacity of and demand for infrastructure have been taken into account. The NPSs also consider relevant issues in relation to safety or technology as well as the circumstances where it would be particularly important to address the adverse impacts of development. They may also specify locations, where appropriate, in order to provide a clear framework for investment and planning decisions.

- 4.2.8 NPSs also include any other policies or circumstances that should be taken into account in decisions on infrastructure development.

Overarching National Policy Statement for Energy (EN-1)

- 4.2.9 NPS EN-1 sets out the Government's policy for delivery of major energy infrastructure. The sector-specific NPSs EN-2 to EN-6 should be read in conjunction with the overarching NPS EN-1, which seeks to ensure the UK's continued secure and reliable supply of electricity while supporting the transition to a low carbon economy to help deliver the Government's climate change objectives.
- 4.2.10 Paragraph 3.3.12 of EN-1 recognises that the interconnection of electricity systems can be used to compensate for the intermittency of renewable generation, playing an important role in a low carbon electricity system. Paragraph 3.3.29 goes on to say that *"interconnection of large-scale, centralised electricity generating facilities via a high voltage transmission system enables the pooling of both generation and demand, which in turn offers a number of economic and other benefits, such as more efficient bulk transfer of power and enabling surplus generation capacity in one area to be used to cover shortfalls elsewhere"*.

National Policy Statement for Electricity Networks Infrastructure (EN-5)

- 4.2.11 NPS EN-5 reiterates the UK's need to develop a low carbon economy while maintaining the security and reliability of supply. Paragraph 1.1.1 acknowledges that this will require a fit for purpose and robust electricity network which will need to have the ability to support an increasingly complex system of supply and demand and cope with electricity generation occurring in more diverse locations.
- 4.2.12 The NPS provides guidance on decision making when considering applications relating to transmission and distribution systems and associated infrastructure regarding site selection, general assessment principles for electricity networks, climate change adaptation, good design, impacts of electricity networks as set out in EN-1, biodiversity and geological conservation, landscape and visual effects, noise and vibration and electric and magnetic fields. It also advises on the weight to be given to certain issues and on mitigation measures, particularly how these may be enforced through conditions or obligations.
- 4.2.13 By linking the British and French electric power grids the Proposed Development will help make energy markets more efficient, improve security of supply and allow for greater flexibility as power grids evolve to adapt to different sources of renewable energy and changes in demand trends and contribute to achieving targets of reducing CO2 emissions.

4.3 Local Policy

East Hampshire District Council

- 4.3.1 The relevant Development Plan documents for East Hampshire include the following:
- Local Plan Part 1 (Joint Core Strategy), adopted May 2014 (this covers the East Hampshire District and the SDNP areas);
 - Local Plan Part 2 (Housing and Employment Allocations), adopted April 2016;
 - Saved policies from the Local Plan: Second Review 2006, adopted March 2006; and
 - Planning Contributions and Community Infrastructure Levy Supplementary Planning Document, adopted April 2016.

- 4.3.2 East Hampshire District Council undertook a six week public consultation on the scope and content of the Local Plan Part 3 (Development Management and Other Allocations) between 4th April and 16th May 2016. It is expected that consultation on draft development management policies and allocations will commence in March 2018. If the draft policies will be published prior to the submission of the planning application, consideration will be given to any relevant emerging policies whilst acknowledging that the plan review is still at an early stage, and any emerging policies will only have limited weight.
- 4.3.3 It is not considered that any of the LPA's Development Briefs, Supplementary Planning Guidance documents or Neighbourhood Plans are relevant to the Proposed Development.
- 4.3.4 Whilst no part of the Proposed Development will be located within the administrative boundaries of the South Downs National Park Authority (SDNPA), it is noted that the SDNPA is currently developing its own Local Plan that will replace the Joint Core Strategy for the SDNPA's administrative area. The preferred options for the Local Plan have been consulted on in September 2015, and it is estimated that the draft Local Plan will be consulted on from 26th September until 22nd November 2017, and submitted for examination in February 2018. Any emerging policies within the consultation version of the Local Plan relevant to the Proposed Development will be given consideration in the ES and associated application documents.
- 4.3.5 At present there are no other SDNPA planning policy documents that are considered to be relevant to the Proposed Development.

Winchester City Council

- 4.3.6 The Development Plan documents for Winchester that are considered relevant to the Proposed Development include the following:
- The Local Plan Part 1 (Joint Core Strategy), adopted in March 2013 including the Adopted Policies Map;
 - The Local Plan Part 2 (Development Management and Allocations), adopted April 2017;
 - Saved policies of Winchester District Local Plan Review 2006 (only applicable in the SDNP);
 - Denmead Neighbourhood Plan 2011 – 2031, adopted April 2015;
 - Denmead Village Design Statement Supplementary Planning Document, adopted February 2016; and
 - Draft Traveller Development Plan Document (July 2017 version).
- 4.3.7 It is not considered that there are any other Winchester City Council Supplementary Planning Documents or Supplementary Planning Guidance that would be relevant to the Proposed Development.
- 4.3.8 As noted above, the SDNPA will adopt its own Local Plan for the National Park, which will eventually replace the remaining saved policies from the Winchester District Local Plan Review 2006 relating to the SDNP area. Any relevant emerging policies will be considered when assessing the environmental impacts of the Proposed Development.

Havant Borough Council

- 4.3.9 The relevant Development Plan documents for Havant comprise the following:

- Local Plan (Core Strategy), adopted March 2011;
 - Local Plan (Allocations), adopted July 2014; and
 - Havant Borough Local Plan Strategic Infrastructure Delivery Plan, adopted May 2014.
- 4.3.10 The Local Plan is currently being reviewed, and the new Local Plan (known as Havant Borough Local Plan 2036) is expected to be submitted for examination in winter of 2018. Consultation on the draft Local Plan is expected to commence in autumn/winter of 2017. The Environmental Statement and associated application documents will have regard to any relevant emerging policy.
- 4.3.11 None of the Council's other Supplementary Planning Documents are considered to be relevant to the Proposed Development.

Portsmouth City Council

- 4.3.12 The documents of the Portsmouth City Development Plan that are considered relevant to the Proposed Development include the following:
- Portsmouth Plan (The Portsmouth Core Strategy), adopted January 2012;
 - Saved policies from the Portsmouth City Local Plan 2006, adopted July 2006;
 - Solent Special Protection Areas Supplementary Planning Document, adopted April 2014;
 - Seafront Masterplan Supplementary Planning Document, adopted April 2013;
 - Eastney Beach Habitat Restoration and Management Plan Supplementary Planning Document, adopted December 2014;
 - Parking Standards and Transport Assessments Supplementary Planning Document, adopted July 2014;
 - Air Quality and Pollution Supplementary Planning Document, adopted March 2006; and
 - Developing Contaminated Land Supplementary Planning Guidance, adopted February 2004.
- 4.3.13 It is not considered that the Somerstown and North Southsea and Southsea Town Centre Action Plans, or any other Supplementary Planning Documents, are relevant to the Proposed Development.
- 4.3.14 The Local Development Scheme for Portsmouth (last updated in July 2017) shows that the Local Plan Review is at its early stages (the issues and options consultation ran from 3rd August until 28th September 2017), with the submission of the new Local Plan for examination expected in October 2018. Any relevant emerging policies will be given consideration when preparing the ES.

Partnership for Urban South Hampshire

- 4.3.15 Partnership for Urban South Hampshire (PUSH) is a partnership of Hampshire County Council and a number of unitary and district authorities, including Portsmouth, East Hampshire, Havant and Winchester. PUSH has produced a number of strategies and policy documents such as the PUSH Green Infrastructure Implementation Framework (adopted October 2012). Where relevant, these will inform the ES and other planning application documents.

South Downs National Park Authority

- 4.3.16 As noted above, the SDNPA is currently developing its first ever own Local Plan. The South Downs Local Plan: Preferred Options (September 2015) document contains the first draft of the new policies. None of the elements of the Proposed Development will be located within the boundaries of the SDNPA, however, due to the close proximity to the National Park, it is considered that some of the emerging policies will be relevant..
- 4.3.17 These policies, or any relevant replacement draft policies which will be published for consultation from 26th September until 22nd November 2017, will be given consideration when preparing the ES and associated planning application documents.

5 Traffic and Transport

This chapter addresses traffic and transport issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

5.1 Baseline conditions

Proposed Converter Station

5.1.1 The road network in the vicinity of the proposed converter station comprises mainly rural lanes handling low volumes of traffic. Site access is anticipated be from Broadway Lane, which is the existing access route to Lovedean substation.

Access to the Site

5.1.2 The key strategic route serving the area is the A3 (M) which connects London to Portsmouth. The closest access point from the A3 (M) (Junction 2) to the site is via:

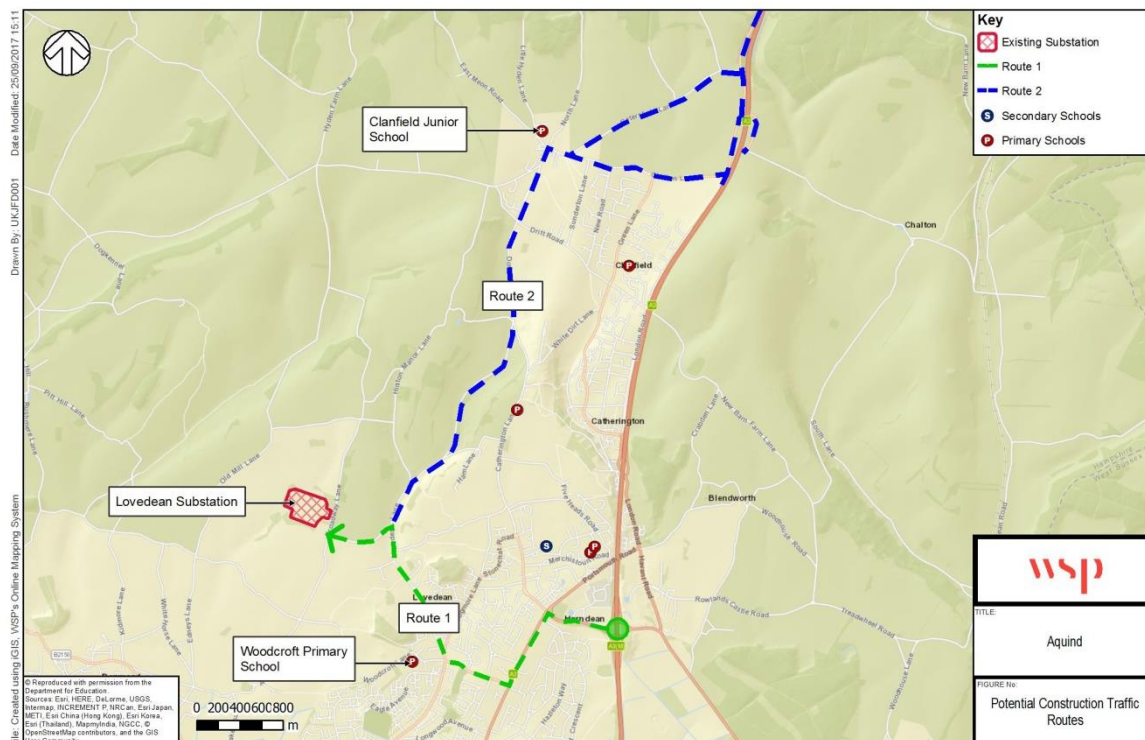
- B2149 > A3 Portsmouth Road > Lovedean Lane > Day Lane > Broadway Lane.

5.1.3 This route is near the Waterlooville Shopping Centre area at the junction of Milton Road / Lovedean Lane; and also lies within close proximity to Woodcroft Primary School. This route is marked as Route 1 in **Inset 5.1** below.

5.1.4 An alternative route exists via:

- Lovedean Lane > Downhouse Road > South Lane > Charlton Lane or Petersfield Lane > A3.

5.1.5 This route follows a path on the outskirts of Clanfield, via Clanfield Junior School, several local parks and a local football club. This is marked as Route 2 in **Inset 5.1**.



Inset 5.1: Potential Traffic Routes to the Converter Station Site

Cable Route and Landfall

5.1.6 Where possible, the cable route will be located within roads. The cable route, running from the landfall to the proposed converter station, aligns with the following roads and streets:

- Henderson Road;
- Bransbury Road;
- A288 Milton Road;
- A2030 Velder Avenue / Eastern Road (including crossing a water feature, running underneath the A27 Havant Bypass);
- Through a playing field and supermarket car park, crossing the West Coastway railway line;
- Havant Road;
- Farlington Avenue;
- Portsdown Hill Road;
- A3 London Road; and
- B2150 Hambledon Road.

5.1.7 From the Hambledon Road / Milton Road junction, there are two possible route options towards the proposed converter station.

Table 5.1 Roads along the two cable route options from the Hambledon Road / Milton Road junction

OPTION 1	OPTION 2
<ul style="list-style-type: none"> • Hambledon Road • Through a field between Soake Road and Forest Road junctions • Across Anmore Road • Across Crossway's Road • Through fields to the Site 	<ul style="list-style-type: none"> • Milton Road • Lovedean Lane • Day Lane • The Site

5.2 Scope of Assessment

Sensitive Receptors

5.2.1 The following sensitive receptors have been identified and will be considered within the ES:

Proposed Converter Station

- Motorised users of local roads, including vehicle drivers and public transport users; and
- Non-motorised users of local roads and PRoW, including pedestrians, cyclists and equestrians. Potential area which would be affected by construction traffic includes the following junctions:
 - A3 London Road / Petersfield Lane / Chalton Lane junction interchange;
 - A3(M) / B2149 junction interchange (Junction 2);
 - B2149 / Lakesmere Road
 - B2149 / A3 Portsmouth Road / Catherington Lane; and
 - Chalton Lane / E Meon Road (Clanfield Village).

Proposed Cable Route and Landfall

- Motorised users of local roads, including vehicle drivers and public transport users; and
- Non-motorised users of local roads and PRow, including pedestrians, cyclists and equestrians. Potential area which would be affected by construction traffic includes the following roads: Henderson Road;
 - Bransbury Road;
 - A288 Milton Road;
 - A2030 Velder Avenue / Eastern Road (including crossing a water feature, running underneath the A27 Havant Bypass);
 - Through a playing field and supermarket car park, crossing the West Coastway railway line;
 - Havant Road;
 - Farlington Avenue;
 - Portsdown Hill Road;
 - A3 London Road;
 - B2150 Hambledon Road;
 - Soake Road and Forest Road junctions;
 - Anmore Road;
 - Crossway's Road;
 - Milton Road;
 - Lovedean Lane; and
 - Day Lane.

Insignificant Effects

5.2.2 Following construction there will be a very small number of employees (3-4) at the proposed converter station during the operational stage, and as such, the operational stage of the Proposed Development will be insignificant in traffic and transportation terms and will not be considered further.

Likely Significant Effects

5.2.3 **Table 5.2** summarises the predicted effects of the construction of the proposed converter station which will be assessed as part of the EIA.

Table 5.2: Likely significant effects of the converter station

EFFECT	RECEPTOR	DEVELOPMENT STAGE
Nuisance and disruption to users of the local road network caused by construction traffic (including heavy goods vehicles (HGVs)).	Users of the local road network including vehicles, pedestrians, equestrians and cyclists.	Construction
Fear and intimidation, increased traffic delay, severance and road safety impacts on residents as a result of construction stage traffic (consisting of HGVs, Abnormal Loads, cars and LGVs) travelling to and from the Site.	Residents within the local area that live alongside construction traffic routes.	Construction

5.2.4 **Table 5.3** summarises the predicted effects of the construction of the cable route and landfall which will be assessed as part of the EIA.

Table 5.3: Likely significant effects of the cable route and landfall

EFFECT	RECEPTOR	DEVELOPMENT STAGE
Cumulative effect of road closures and traffic diversions during cable route construction.	Users of the local road network including vehicle, pedestrians, equestrians and cyclists.	Construction

5.3 Assessment Methodology

5.3.1 An overview of the methodology that will be used in the EIA is presented below:

- Desk-study to identify the existing local and strategic road network and PRoW routes within the vicinity of the Proposed Development;
- Nuisance and disruption caused by construction traffic and activities on motorised and non-motorised users will be considered from information provided within a Transport Assessment or Statement (document is dependent on size of development and scoping with the Local Authority). This will specifically consider the increases of traffic on the network study area during the construction stage and associated changes to motorised and non-motorised users in terms of severance, delay, safety, fear and driver stress; and
- The assessment will be in line with the principles outlined in Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 8 and Part 9, Guidelines for the Environmental Assessment of Road Traffic and Planning for the Future: a guide to working with Highways England on planning matters (paragraphs 48-53)¹.

5.3.2 Further detail regarding the assessment methodology is presented below. The EIA methodology will be subject to the agreement of the highway authorities impacted by the Proposed Development.

Assessment Methodology - Highways Network

5.3.3 This will include an assessment of the local traffic impacts of the Proposed Development. This is likely to consider the peak traffic movements anticipated during the construction stage; taking account of the proposed programme of works, the size of the anticipated peak workforce, the proposed working hours and peak HGV movements expected to be generated by the works.

5.3.4 It is likely that the assessment will consider two peak network hours, in the morning and evening, taking account of the existing network conditions and the timing of anticipated construction traffic movements. Traffic surveys will inform the local network peak periods.

5.3.5 The assessment will focus on the local road network, which will provide access to the proposed converter station, the existing Lovedean substation, and the roads where the cable route intercepts.

5.3.6 The potential network which would be affected by the Proposed Development includes the sensitive receptors listed above in **Section 5.2: Scope of Assessment**.

¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/461023/N150227_-_Highways_England_Planning_Document_FINAL-lo.pdf

- 5.3.7 Traffic may also be affected by traffic management along the cable route. Traffic management may include temporary lane or road closures which would require suitable diversions to be implemented.
- 5.3.8 Further discussions are required with Hampshire County Council, Portsmouth City Council, Havant Borough Council, East Hampshire District Council, Winchester City Council, as well as Highways England, to explain and understand the full impacts of the Proposed Development and confirm the scope of the Traffic and Transport assessment.
- 5.3.9 Traffic generation will be estimated based on the contractor's requirements for each area of work and labour types. The number of trip movements will be broken down whether they are linked to the construction of the proposed converter station or installation of the cable.
- 5.3.10 In terms of traffic distribution, the following methodology is proposed to assess the distribution of light and heavy goods vehicles and worker trips:
1. Construction traffic will follow designated routes to the proposed converter station and cable sections. These routes are to be agreed with the local highway authorities; and
 2. Light vehicles, relating to staff will be distributed using a gravity model based on population centres.
- 5.3.11 The construction phasing will be confirmed within the ES although at this stage it is envisaged that the construction period of the proposed converter station will commence in 2019 and be completed in 2022.

Assessment Methodology - Road Safety

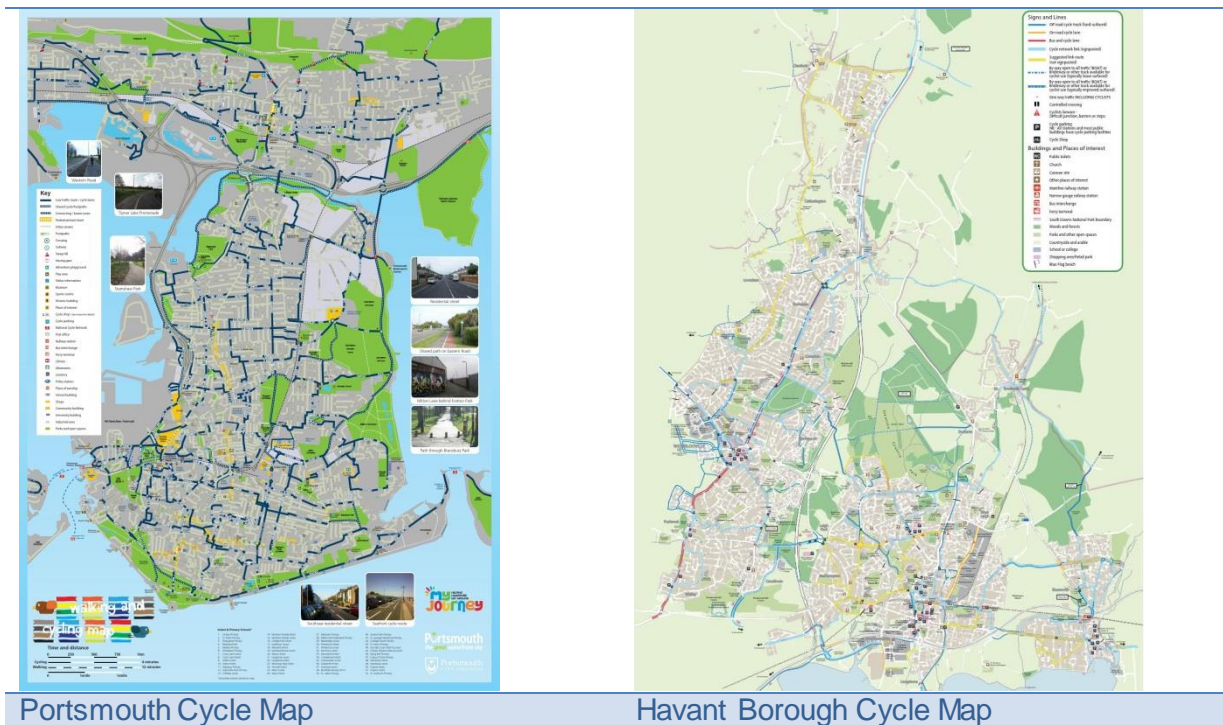
- 5.3.12 An analysis of Personal Injury Accident (PIA) data for the past five years will be conducted on the roads and streets along the proposed electric cable route and on the potential access routes to the proposed converter station.
- 5.3.13 The exact extent of the network to be analysed will be confirmed with the local highway authorities.

Assessment Methodology - Public Transport Network

- 5.3.14 An audit of the existing public transport network in the study area will be undertaken. The impact of the Proposed Development and potential for workers to use public transport will be assessed. Any diversions or disruption caused by the cable route will also be assessed.

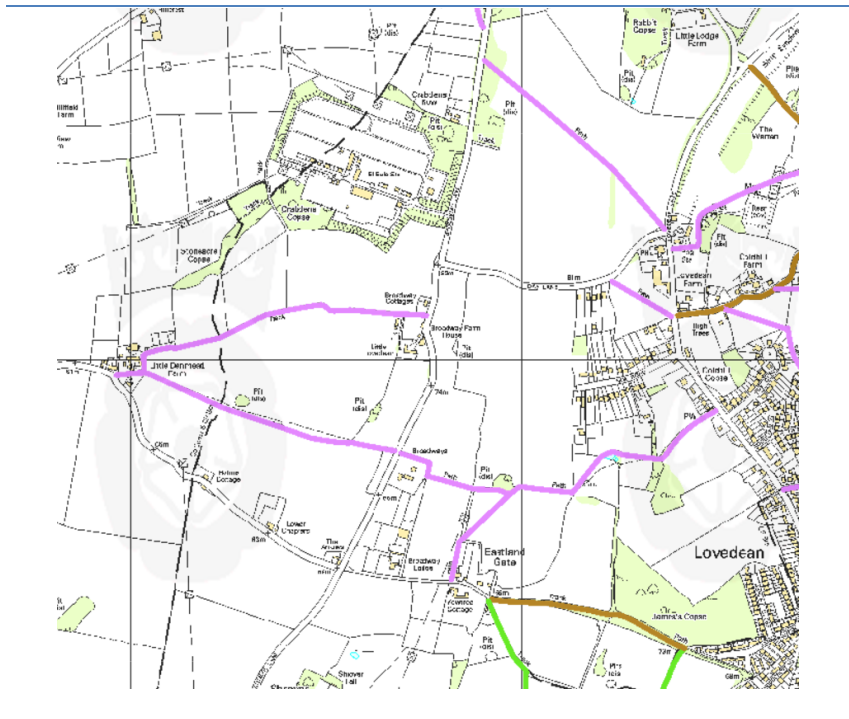
Pedestrian and Cycle Network

- 5.3.15 This will provide an assessment of the impacts of the Proposed Development on the pedestrian and cycle network. This will include impact on PRoW, walking, cycling infrastructure as well as equestrians' routes. Example sources of information are presented in **Inset 5.2**.



Portsmouth Cycle Map

Havant Borough Cycle Map



Public Rights of Way Map – Centred around Lovedean Substation

Inset 5.2: Non-Motorised users map (cycle map / PRoW Map)

Mitigation

- 5.3.16 The Traffic and Transport ES chapter will provide details of proposed mitigation where appropriate. This is likely to include the following:
- Highway improvements – developed through analysis of impacts, access requirements or diversionary impacts. This could potentially include improvements to the network to allow construction traffic to access the proposed converter station if required; and
 - A Construction Traffic Management Plan (CTMP) – is likely to be required to mitigate the impact of the construction stage and associated traffic.
- 5.3.17 Further discussions regarding mitigation proposals will be required in order to ensure that they are acceptable solutions to the local highway authority or Highways England.

6 Air Quality

This chapter addresses air quality issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

6.1 Baseline Conditions

Proposed Converter Station

- 6.1.1 The proposed converter station will be located in a rural environment where air quality is mainly influenced by traffic emissions from small local roads. There are no significant industrial pollution sources in the surrounding area that influence air quality. The proposed converter station will lie between Winchester City Council's and East Hampshire District Council's administrative areas. According to both council's latest Air Quality Annual Status Reports^{2,3}, air quality in the vicinity of the location of the proposed converter station meets all the relevant UK Air Quality Strategy (AQS) objectives.

Cable Route and Landfall

- 6.1.2 The cable route runs through a number of Local Authorities. For the majority of the route, pollution concentrations meet all air quality objectives. However, part of the route goes through an AQMA declared by Portsmouth City Council due to exceedances of the annual mean nitrogen dioxide (NO₂) objective. This AQMA covers a section of road stretching from Milton Road to Eastern Road.
- 6.1.3 Based on the above, air pollutant concentrations in the vicinity of the proposed converter station and for the majority of the cable route meet all the relevant air quality objectives. Annual mean NO₂ concentrations are in exceedance of the UK AQS objective for the section of the route going through the Portsmouth City Council AQMA. Detailed background air quality concentrations will be extracted from Portsmouth City Council's latest air quality reports and national maps provided on the Department for Environment, Food and Rural Affairs (Defra) website⁴. The available local and background air quality data are considered appropriate for use in this assessment and no site specific air quality monitoring will be undertaken to inform the EIA.

6.2 Scope of Assessment

Consultation

- 6.2.1 Consultation with the Environment Health Officers of the relevant Local Authorities will be undertaken to confirm the scope and approach to the air quality assessment

Insignificant Effects

- 6.2.2 The operation of the proposed converter station and cable route will not generate any emissions to air when in use. Operational stage activities will be limited to occasional vehicle trips (e.g. for routine maintenance). However, the number of trips generated is not expected to be above the indicative threshold presented in Environmental

²WCC (2017) 2017 Air Quality Annual Status Report, July 2017

³EHDC (2016). 2016 Air Quality Annual Status Report, August 2016

⁴<https://uk-air.defra.gov.uk/data/lagm-background-home>

Protection UK/Institute of Air Quality Management (IAQM) guidance⁵. An assessment of potential impacts on local air quality from operational traffic emissions has therefore been scoped out of the EIA.

- 6.2.3 An assessment of potential impacts to local air quality from construction traffic emissions has also been scoped out as the additional traffic generated is not expected to be above the indicative threshold presented in EPUK/IAQM guidance document.

Sensitive Receptors

- 6.2.4 For the construction stage, the assessment will consider human receptors within 350m from site boundary and 50m from construction routes, and ecological receptors within 50m from site boundary and 50m construction routes. This is in accordance with the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction (2016 version 1.1)'⁶.

Likely Significant Effects

- 6.2.5 The following potential impacts are likely to be associated with the construction stage of the Proposed Development:
- Potential impact on human and ecological receptors from dust and Particulate Matter generated during the site preparation and construction stage; and
 - Potential impact on human and ecological receptors due to changes in local pollutant concentrations (NO₂, PM₁₀ and PM_{2.5}) due to exhaust emissions from construction vehicles and plant.
- 6.2.6 As detailed above, no operational impacts on air quality are anticipated.

6.3 Assessment Methodology

- 6.3.1 The approach to the assessment of air quality will be agreed with all the relevant Local Authorities. Based on the likely environmental effects detailed above, the scope of the assessment will include the following:
- A qualitative assessment of the impacts of dust and particulate matter generated during the construction stage of the Proposed Development will be undertaken following the IAQM construction guidance; and
 - A qualitative assessment of the effects of exhaust emissions from construction traffic and plant on local air quality at nearby sensitive receptors.
- 6.3.2 The IAQM guidance on the assessment of construction impacts provides distance-based criteria for qualitatively assessing dust / particulate matter impacts from construction activities and impacts from mobile plant emissions. This guidance recommends that the potential for dust emissions from four different types of construction activities are assessed: Demolition, Earthworks, Construction and Trackout (the movement of dust/mud offsite on haulage vehicles wheels and bodies onto the public road network where it may be re-suspended by other vehicles).

⁵ Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning and Development Control: Planning for Air Quality

⁶ IAQM Guidance on the assessment of dust from demolition and construction, (Version 1.1 Updated June 2016)

- 6.3.3 The qualitative assessment of effects from construction traffic and plant will be undertaken based on professional judgement and information on the number and type of construction traffic and plant, the proximity of sensitive receptors, the construction routes; the duration of the construction stage and the nature of the construction activities.
- 6.3.4 The assessment of impacts during the construction stage will be based on information available at the time and assumptions will be made if necessary, based on the duration and number of equipment used, and professional judgement.

7 Noise and Vibration

This chapter addresses noise and vibration issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

7.1 Baseline Conditions

Proposed Converter Station

- 7.1.1 A baseline noise survey has been undertaken at locations representative of the closest residential receptors to the proposed converter station. Additional measurements have been undertaken close to the existing Lovedean substation.
- 7.1.2 A combination of attended and unattended noise measurements were undertaken between Wednesday 28th June and Thursday 6th July 2017.
- 7.1.3 Given the rural location of the proposed converter station, the noise climate at the closest residential receptors is generally low, with few dominant noise sources in the area. The substation noise levels are dominant when close to its boundary.
- 7.1.4 The noise survey data will be provided in the Noise and Vibration chapter of the ES.

Cable Route and Landfall

- 7.1.5 A baseline noise survey will be undertaken along the cable route at the earliest opportunity. This survey will comprise both attended and unattended measurements at up to ten locations.
- 7.1.6 The survey methodology and locations will be agreed with the local planning authorities prior to undertaking the measurements.
- 7.1.7 A meeting will be organised in due course with both LPA to discuss the noise assessment methodology and scope in more detail.

7.2 Scope of Assessment

- 7.2.1 The exact scope of the noise and vibration EIA will be discussed and agreed during consultation with the Environmental Health Officers at East Hampshire District Council and Winchester City Council. Notwithstanding this, the scope of works is likely to comprise:
 - A baseline noise survey over a period of at least three days close to the proposed converter station and at selected locations along the cable route;
 - An assessment of construction stage noise and vibration effects in accordance with BS 5228: 2009+A1:2014 for both the proposed converter station and the cable route;
 - An assessment of converter station noise in accordance with BS 4142: 2014 and other criteria, the detail of which are to be agreed with the local planning authorities;
 - The significance of effects identified will be assessed using criteria derived from relevant British Standards and guidance documents. The approach and terminology set out in Section 5 will be followed to assess the significance of effects whereby the magnitude of change in noise levels and the sensitivity of the receptor will be considered; and
 - Where necessary, mitigation measures will be specified to minimise any noise and vibration effects.

7.3 Assessment Methodology

- 7.3.1 Initial consultation with both East Hampshire District Council and Winchester City Council's environmental health departments to discuss the baseline noise surveys and assessment methodologies has been undertaken.
- 7.3.2 It was established that, whilst an assessment in accordance with BS 4142 should be undertaken, a more in-depth assessment considering octave band noise levels should be undertaken. Both LPAs have stated that the overall aspiration is for there to be no increase to existing ambient noise levels as a result of the proposed converter station.
- 7.3.3 The noise and vibration assessment will include the following:
- A robust baseline noise survey data set will be obtained which will be used for the following:
 - To derive appropriate noise limits for the construction stage at the closest proposed receptors to the proposed converter station and the cabling route in accordance with BS 5228 and any relevant criteria stipulated by the local planning authorities and
 - To derive appropriate noise criteria for the proposed converter station in accordance with BS 4142.
 - The construction noise predictions will be undertaken and assessed in line with the methodologies in BS 5228 2009+A1:2014;
 - The converter station noise assessment will be undertaken in two stages:
 - An assessment will be undertaken in accordance with BS 4142: 2014 to provide an initial indication of noise levels from the proposed converter station; and
 - An assessment will be undertaken considering the proposed converter station noise levels in octave bands and compared against existing noise levels to determine any increase. The methodology for this assessment will be determined during further consultation with the local planning authorities.
 - Where necessary and feasible, we will recommend noise mitigation measures to reduce construction and converter station noise levels.
- 7.3.4 Operational noise along the cable route is expected to be negligible and has been scoped out of the EIA.

8 Landscape and Visual

This chapter addresses landscape and visual issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs. However, responses in relation to the proposed converter station should be limited to Winchester City Council and East Hampshire District Council. Similarly, seascape considerations at the landfall are only relevant for Portsmouth City Council.

8.1 Baseline Conditions

Proposed Converter Station

Site Description

- 8.1.1 Lovedean substation is located in a rural area on the northern fringes of Portsmouth, about 13.5km to the north of the city centre. It is surrounded by mixed agricultural fields with hedgerow boundaries and individual farm properties connected by narrow lanes. The settlements of Lovedean and Waterlooville lie to the south east, Horndean to the east and Denmead to the south west. A number of Public Rights of Way (PRoW) cross the area and link to surrounding villages.
- 8.1.2 Specific characteristics associated with the proposed converter station options are outlined below:
- Site Option A lies to the south of Lovedean substation within an arable field. Gradients slope gently north south from approximately 80 to 70m AOD. The south west corner of the site would lie to the north of a deciduous copse whilst the eastern edge of the site would run adjacent to Broadway Farm. An access road would connect the proposed converter station to Broadway Lane.
 - Site Option B lies to the west of Lovedean substation and would span across six small fields divided by hedgerows and used for horse grazing and off road vehicles. Land falls from approximately 90 to 80m AOD. A new access route would connect the proposed substation with Broadway Lane to the east and either run to the north or south of the existing substation.

Designations

- 8.1.3 The SDNP encloses Lovedean substation and the proposed converter station, set back to the north and west and within 50m to the east. The Hambledon Conservation Area lies within the SDNP to the northwest of the substation while Catherington Conservation Area lies to the north east. A number of Listed Buildings predominately Grade II lie within Lovedean, Denmead, Hambledon and along the narrow lanes mainly to the east of the substation, with the closest being at Denmead Farm, off Edneys Lane.
- 8.1.4 The proposed converter substation is surrounded by pockets of woodland including Ancient Woodland. The SDNP has been given the status of an International Dark Skies Reserve.

Landscape Character

- 8.1.5 The National Character Area Profiles (NCAPs), as defined on the National Character Areas Map of England (Natural England) indicates that proposed converter station land lies within NCA 125 The South Downs. The NCA describes the landscape as

one of contrasts, the downland creating a sense of openness whilst enclosure and remoteness is evident within woodlands and close to urban areas.

- 8.1.6 At a county level the proposed converter station options lie within LCA 7H South East Hampshire Downs (Hampshire County Integrated Character Assessment, 2012 refer). The landscape is “a large scale downland” and predominate “landscape type, typical with expansive, rolling arable landscapes and extensive wooded visual horizons”
- 8.1.7 Site Option A lies within LCA 3F Downland Mosaic, East Hampshire Landscape Character Assessment, 2006 (EHLCA), whilst Site Option B falls LCA 17 Hambledon Down, Winchester Landscape Character Assessment, 2004 (WCCLCA). Although the options lie within different administrative areas, their key characteristics are similar. Characteristics of relevance to both preferred options and their immediate surroundings, and drawn from the above landscape character assessments, are outlined below:
- *“Undulating rolling landform..... The land gradually falls from the north-east to the Hambledon valley, but with a secondary ridge east/west of Hambledon. Scarps and dry valleys are common features” (WCCLCA);*
 - *“A mixture of 18th and 19th century arable fields and early post medieval pasture fields, with pockets of older medieval assarts surrounded by woodland. This mosaic of habitats supports arable weeds and farmland birds.” (EHLCA);*
 - *“A variety of copses, shelter-belts and woodlands, many of which are ancient semi-natural woodland and designated as Sites of Importance for Nature Conservation.” (WCCLCA);*
 - *“Medium to large irregular wavy fields formed through the enclosure of downland in medieval times, together with more regular fields created at the time of parliamentary enclosure”. (WCCLCA);*
 - *“Varied degrees of visual enclosure, from the exposed downs to the more enclosed areas to the south of the character area, with a strong pattern of hedgerows, intermittent trees and woodland.” (WCCLCA);*
 - *“A strong pattern of woodland cover, many of which are of ancient origin and some of which are of national importance, and hedgerows providing enclosure which contrasts with the open farmland.” (EHLCA);*
 - *“Numerous long views from high points on the Downs.” (WCCLCA);*
 - *“A low density of dispersed settlement across the downland with a scattering of nucleated settlement in preferred lower lying areas. Distinctive churches are often landmarks.” (EHLCA); and*
 - *“Tranquil rural nature with no major routes which passing through the area (the main one being the B2150). Routes consist of an intricate network of ancient minor roads, lanes and drove roads. These are mainly straight and open across the downs and winding and narrow elsewhere.” (WCCLCA).*
- 8.1.8 It should be noted that whilst the preferred options do not fall within SDNP, consideration needs to be given to one of the special qualities of the South Downs which is the “diverse, inspirational landscapes and breath taking views”. Equally due regard should be given to the following points referred to within the South Downs Integrated Landscape Character Assessment, 2011:

“the strong rural , secluded character of the landscape which may be threatened by expansion of settlements which abut its southern edge,” and

“.. The views southwards across downlands from the secondary hills at Windmill Down, Broadhalfpenny Down and Home Down “approximately 2.5km to the north”.

Visual Amenity

- 8.1.9 Lovedean substation is well screened by a belt of deciduous woodland which wraps around the site. Views from local roads in the short to middle distance are filtered by layers of intervening vegetation and built form consisting of isolated farms and cottages. Notable in most views, and particularly from higher ground to the north, is the increasing concentration of pylons and associated transmission lines clustering towards the substation.
- 8.1.10 Both proposed converter station options would be partially screened by vegetation in middle and long distance views. In terms of short distance views, Site Option A would be noticeable from two PRowWs which run to the north and south of the site and link Denmead Farm to the west to Broadway Lane in the east. There are no PRowWs which run immediately adjacent to Site Option B.
- 8.1.11 Residents of individual properties close to the edge of both options, from higher ground as well as residents situated on the fringes of the larger settlements to the south, south east, may experience views of the proposed converter station.
- 8.1.12 Whilst the preferred options do not fall within any key views identified in Hambledon Character Appraisal and Management Strategy (2009) or Catherington Conservation Area Character and Appraisal (2006) it is likely that both options will be notable from specific viewpoints identified within the View Characterisation and Analysis SDNP (2015). Three specific viewpoints which lie outside the 3km study area were discussed with the LPAs. These included Old Winchester Hill approximately 8km to the northwest, Windmill Hill approximately 5km to the northeast and views from close to Fort Widley, Port Downs approximately 7km away. The first two lie within the SDNP.
- 8.1.13 Visual effects would be experienced by the people who live and work in the area, along with those enjoying recreational activities in this area or simply passing through. Whilst it is people who are the actual receptors of visual effects it is the places they may occupy that are listed below and described as visual receptors.

Residential Receptors:

- Individual farmsteads and cottages to the north of the substation;
- Properties off Broadway Lane to the east of the substation;
- Properties off Old Mill Lane / Edneys Lane / Denmead Lane / White Horse Lane / Rushmere Lane to the west of the substation;
- Properties off lanes which link Old Mill Lane with Broadway Lane to the south of the substation; and
- Properties on the fringes of Denmead, Anmore, Catherington and Horndean.

Recreational and Visitor Receptors:

- Users of the Monarch Way which runs to the north and east of the substation;
- Users of local PRowW including local tracks; and
- Users of open access land at Catherington Down.

Transport Receptors:

- Users of the local road network.

Cable Route and Landfall

Landscape Character

- 8.1.14 The transition bay will be located on the shoreline at Eastney and within Marine Character Area 5: The Solent, Seascape Assessment for the South Marine Plan Areas, 2014. The Marine Character Area (MCA) is described as a transition zone; a *“distinctive narrow stretch of sea of the Solent and its adjoining channels”. The “busy water and sport developments contrasting with the high tranquil coastline (particularly within the New Forest National Park, Isle of Wight and Chichester Harbour AONBs) and internationally important wildlife havens.”*
- 8.1.15 The area is also “steeped in maritime history reflecting its important role in defence and trade”. A number of heritage assets lie close to the proposed siting of the transmission bay including Fort Cumberland; a Scheduled Monument.
- 8.1.16 Between Eastney and Lovedean the cable route will run through three NCA from Eastney landfall (land/sea transition joint bay) located within NCA 126: South Coast Plain, NCA 128 South Hampshire Lowlands to NCA 125 The South Downs. At a County and District level the cable route is likely to run through the following LCA:
- LCA 11 C Eastern Solent, LCA 8i Portdown Hill Open Downs, LCA 2f Forest of Bere East and LCA 7h South East Hampshire Downs (Hampshire County Integrated Character Assessment, 2012);
 - LCA 3f (East Hampshire Character Assessment, 2006);
 - LCA 17 Hambledon Downs and LCA 18 Forest of Bere (Winchester Landscape Character Assessment, 2004); and
 - The AC cable routes connecting the proposed converter station to Lovedean substation will either run through LCA 17 Hambledon Downs (Winchester Landscape Character Assessment, 2004) or 3f Downland Mosaic (East Hampshire Character Assessment, 2006).

Visual Amenity

- 8.1.17 Visual effects associated with the laying of the cable routes and land/sea transition bay will be temporary and experienced by a variety of users including recreational users utilising PROWs and public footpaths, local residents and road users including cycles and horse riders. The land will be reinstated following the installation of the cables and thus returned to its previous use. There will be no permanent visible sign of the works.
- 8.1.18 There may be long term effects resulting from the loss of existing vegetation (hedgerows and hedgerow trees) where the new cable runs across open fields covering the last 2km of the route. The extent of vegetation loss will be subject to the confirmation of the final route option.

8.2 Scope of Assessment

- 8.2.1 Landscape and visual effects are separate, though interlinked, topic areas. Landscape effects can be defined as the changes in the fabric and quality of the landscape as a result of a development through:
- Direct effects upon specific landscape elements;

- Subtler effects upon the overall patterns of elements that give rise to landscape character and regional and local distinctiveness; and
- Effects upon special interests or values such as designated landscapes, built heritage assets and cultural associations.

8.2.2 Visual effects can be defined as changes to the visual amenity or quality of the view, particularly for people (visual receptors) for whom enjoyment of the view is a primary part of their activity, such as those engaging in outdoor recreation, or who will be exposed to the view for extensive periods, such as people in their homes. These would be defined as particularly sensitive receptors.

Likely Significant Effects

8.2.3 Significant landscape and visual effects are predicted to occur as a result of the following impacts:

- Construction activities including cable route installations, temporary vehicular route for construction vehicles and temporary laydown area close to the proposed converter station;
- New structures associated with the proposed converter station and new access road, lighting, signage, fencing and landscaping including ground modelling to level the proposed converter station and utilise excess material;
- Changes to the local landscape character as a result of the proposed converter station and surroundings including the off road section of cable route (both from the converter station to the landfall and from the converter station to the substation), both during the construction and operational stages;
- Loss of features including characteristic vegetation such as Ancient Woodland, copses, hedgerows, hedgerow trees and individual trees;
- Changes impacting on the composition of key views including from surrounding residential, open access land, PROWs and highways; and
- The setting of built assets including Conservation Areas and Listed Buildings.

Significant and Insignificant Effects

8.2.4 **Table 8.1** below outlines both significant and insignificant effects. Insignificant effects will not be considered further within the landscape and visual impact assessment (LVIA).

Table 8.1: Issues to be scoped in and out of the LVIA

ISSUE	SCOPING		EXPLANATION
	IN	OUT	
Proposed Converter Station			
Landscape Character			
Effects on the landscape resource within 3km of the Site Boundary during construction and decommissioning.	✓		Changes on the landscape resource and associated features within 3 km of the study area during construction and decommissioning. Works will include a new construction access route and laydown area as well as a change in land use and topography.
Effects on the landscape resource within 3km of the Site Boundary during operation.	✓		Changes to landscape character within and surrounding the Study Area due to new built form, lighting and landscaping.
Effects on landscape resource beyond 3 km during construction, operation and	✓		Changes to landscape character and associated features further than 3 km from the Site boundary. Effects on character will be

ISSUE	SCOPING		EXPLANATION
	IN	OUT	
decommissioning.			largely dependent on inter-visibility with the Proposed Development and perceptual appreciation of changes in the extent, size and scale of development in the landscape and its relationship to Lovedean substation.
Visual Amenity			
Effects on visual receptors within 3km of the Site boundary during construction, operation and decommissioning.	✓		Changes in the visual amenity of visual receptors due to on site demolition, construction and decommissioning as a result of changes to landscape character.
Effects on visual receptors beyond 3 km of the site boundary.		✓	Changes in the visual amenity of visual receptors due to the new built form and vegetation.
Cable Route and Landfall			
Landscape / Seascape Character			
Effects on landscape and seascape character and features associated with the landfall during construction, operation and decommissioning.		✓	Whilst temporary effects will be generated associated with the landfall these will be short term and the scale of construction works will be minimal. Works will result in a below ground structure which will house the transition bay. Land will be reinstated following construction.
Effects on landscape character and features associated with the DC cable route during construction, operation and decommissioning.	✓		Permanent landscape effects will be insignificant along the route apart from the last 2km where the route may cross fields rather than utilise existing roads. Here there may be subject to determination of the preferred option and route option the permanent loss of landscape features which contribute to landscape character and screening.
Effects on landscape character and features associated with the AC cable route during construction, operation and decommissioning.	✓		Due to the width of the route required for the AC cables there is likely to be a permanent loss in landscape features which contribute to landscape character and screening.
Visual Amenity			
Effects on visual receptors within 100m buffer on either side of the cable route and landfall beyond 2km of the proposed converter station during construction, decommissioning and operation.		✓	Temporary short term effects will be generated during construction along the route and adjacent to the landfall. The land will be reinstated following the installation of the cables and returned to its previous use.
Effects on visual receptors within 100m buffer on either side of the cable route up to 2km of the proposed converter station.		✓	Changes in the visual amenity of visual receptors due to land take and loss of vegetation. Extent of vegetation loss associated with hedgerows and hedgerow trees will be dependent on route option selected.

8.3 Assessment Methodology

8.3.1 The LVIA will address landscape and visual amenity issues relating to the Proposed Development and associated with the UK onshore elements of the Project during construction, operation and decommissioning. The assessment will be carried out in accordance with “The Guidelines for Landscape and Visual Assessment” (GLVIA) published by the Landscape Institute (LI) and the Institute of Environmental Management and Assessment (IEMA), 3rd Edition (2013). In addition, guidance in

“An Approach to Landscape Character Assessment”, Natural England (2014) will also be reviewed.

- 8.3.2 Reference will also be made to relevant local planning policy documents, and regional and local guidance including landscape character assessments as well as aerial photographs and OS data.

Proposed Viewpoint Selection

- 8.3.3 The proposed Study Area for visual effects was based on a radius of 3km for each preferred options and informed by a baseline review and optioneering study. Subject to discussions with the LPAs the Study Area may extend further to take into account two long distance views from within the SDNP. For the cable routes the Study Area is assumed to be a working width of 20m with a 100m buffer along either side of the working widths.
- 8.3.4 A digital terrain model (generated from LiDAR data) and engineering drawings was used to produce a Zone of Theoretical Visibility (ZTV) for each of the preferred options based on a viewer's height of 1.8m and drawing on four variations in point data ranging from the proposed converter hall at 22m to the transformers, switchyards, terminators and reactors at a maximum height of 12m. Changes in the layout's orientation were also tested to determine whether this had an effect on the extent of visibility.
- 8.3.5 Representative viewpoints will be agreed in consultation with LPAs. They will be based on publically accessible locations and site access to both the proposed converter station and cable route will inform the Zone of Visual Influence. The viewpoints will be taken during the summer and judgements may be revised following a further site visit in the winter (subject to discussion with LPAs). The nature of visual and landscape receptors and the likely effects of the Proposed Development will be verified in the field through site visits. As outlined above, three specific viewpoints which fall outside the 3km zone have also been included in discussions with LPAs and SDNP. These include Old Winchester Downs, Windmill Hill and close to Fort Widley, Port Down.
- 8.3.6 High sensitivity receptors will include residents as well as users of public amenity areas and local footpaths.
- 8.3.7 Viewpoint photography will be undertaken to represent short, medium and long-range views to determine the level of effect arising from the introduction of the Proposed Development. A maximum of 15 viewpoints from representative locations has been allowed for. Photomontages may be required to illustrate views of the proposed converter station from selected high sensitivity viewpoints. Viewpoint locations and photomontage viewpoints will be agreed in consultation with the LPAs and SDNP. It was agreed that winter viewpoints would be required.
- 8.3.8 The methodology for the photography will be in accordance with Landscape Institute Advice Note 01/11 (2011); “Photography and Photomontage in Landscape and Visual Impact Assessment”.

Landscape Character Assessment

- 8.3.9 The proposed Study Area for landscape effects will also be within 3km of the boundary of the proposed converter station options. The 3km study areas has been informed by the optioneering study and site visits.
- 8.3.10 For the cable routes the Study Area is assumed to be a working width of 20m with a 100m buffer along either side of the working widths.
- 8.3.11 The landscape character resource will be characterised through a review of relevant National Character Area Profiles, Hampshire County Integrated Character Assessment, 2012, East Hampshire Character Assessment, 2006, Winchester Landscape Character Assessment, 2004 and Havant Borough Landscape Character Assessment, 2007.
- 8.3.12 The assessment will be undertaken in parallel and informed by a combination of desk study appraisal and site visits. Where appropriate this will be supplemented by further information gathered from site visits, Conservation Area Character Maps and Appraisals and Assessments and Hampshire Historic Landscape Characterisation Map.

Determining the Significance of Effects

- 8.3.13 The significance of effect is determined by combining the assessed sensitivity of the landscape or visual receptor with the anticipated scale, duration and incongruity of impacts from the Proposed Development.
- 8.3.14 Effects will be assessed for:
- The construction stage;
 - Operational stage 1 (or year 1 when changes are most obvious);
 - Operational stage 15 years after commencement of operations when any mitigation would be considered to have matured to maximum effectiveness; and
 - Decommissioning of the site after a 40 year period.

Mitigation

- 8.3.15 Through an iterative design process and close consultation internally with the design team (and externally with the LPAs) measures will be considered to reduce landscape and visual and ecological effects and create positive new habitats. A set of principles will be used to inform the micro-siting of each preferred option, influence the scheme design and purpose of the assessment. Principles will:
- Consider the different effects of all elements of the development: proposed converter station, access track and cable connections;
 - Integrate the development and associated infrastructure into the surrounding topography;
 - Seek to cut the proposed converter station construction platform into the gentle hill slope, to reduce the ridge level of the building;
 - Work with the shape of the land and making positive use of material arising from the works to create new screening landform and reduce the apparent height of the building;
 - Minimise the loss of existing vegetation of ecological value (particularly long established hedgerows and veteran trees);

- Introduce new planting which is sympathetic to the surrounding landscape character and, in consultation with the ecology team, reflective of native species;
- Consider the soil types, seeding mixes and management regimes to create species-rich meadows and glades within areas of new screen planting;
- Consider the potential for introducing offsite planting in discussion with adjacent landowners to reduce effects of middle and long distance views; and
- Consider height, mass, colour, texture and nature of materials for the buildings and associated infrastructure which is sensitive to the immediate surroundings.

9 Heritage and Archaeology

This chapter addresses heritage and archaeology issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs. However, responses in relation to the proposed converter station should be limited to Winchester City Council and East Hampshire District Council. Similarly, heritage and archaeology issues at the landfall are only relevant for Portsmouth City Council.

9.1 Baseline Conditions

Proposed Converter Station

Designated Heritage Assets

- 9.1.1 There are a number of options being considered for the location of the proposed converter station. Neither of the options contain any designated heritage assets, such as scheduled monuments or listed buildings.
- 9.1.2 A study area of 2km of the proposed converter station will be assessed for possible setting impacts, although the designated assets within this area will be filtered depending on a zone of theoretical visibility (ZTV) prepared as part of the EIA. The 2km area defined for this Scoping Report contains 23 Grade II Listed buildings and one conservation area (Figure 9.1). There are no world heritage sites, scheduled monuments or registered parks and gardens. The closest listed building is the Grade II listed 'The Old Thatched Cottage', approximately 1.2km to the east of the proposed converter station.

Historic Environment Potential

- 9.1.3 The potential for possible, previously unrecorded archaeological remains, along with above ground remains such as earthworks and undesignated build heritage, will be considered in the EIA following the collation and review of a broad range of data sources (see below). This will assess the likely potential, nature, extent, survival and significance of any remains present, and will consider factors which may have compromised survival.
- 9.1.4 The Site is underlain by varying geology. To the north of Portsea Island, the cable route and the proposed converter station are underlain by Head Deposits and Chalk. The geology and the access to Portsmouth Bay and the coast suggest that the proposed converter station lies within an area that was conducive to early settlement and farming.

Cable Route and Landfall

Designated Heritage Assets

- 9.1.5 The eastern edge of the landfall boundary falls within the constraint area of a Scheduled Monument. This is the late 19th century Fort Cumberland, an angled bastioned fort on the south-west of Portsea Island. The scheduled constraint area encompasses the above-ground star-shaped fort itself (which is also a Grade II* listed building) and its immediate surroundings. Archaeological investigations at the fort in the past have recorded below ground evidence of the glacis (artificial slope), along with ramparts and ditches belonging to earlier phases of the fort.

- 9.1.6 The landfall boundary contains four listed buildings. In addition to Fort Cumberland, there are Second World War defences, in the form of anti-tank concrete blocks at Eastney beach (Grade II) and a pill box (Grade II). The south-west of the landfall boundary has a series of Grade II listed lamp columns, dating to the early 20th century.
- 9.1.7 The cable route does not contain any nationally designated heritage assets. Within a 1km study corridor centred on the cable route (500m on either side of the route line) there are four scheduled monuments and 46 listed buildings (see Figures 9.2, 9.3 and 9.4). The scheduled monuments include the forts and perimeter defences at Eastney, Fort Cumberland, Eastney Sewage pumping station, Hillsea Lines and Fort Purbrook in Farlington. Two of the buildings are Grade II* listed (Fort Cumberland structures and Fort Purbrook in Farlington). The cable route crosses the Eastney Barracks Conservation Area, as designated by Portsmouth City Council.
- 9.1.8 Note that in terms of possible setting impacts, these have been scoped out along the cable route and at landfall, as the cable would be laid entirely below ground. At the landfall no above ground structures are proposed.
- 9.1.9 Hampshire County Council has mapped Archaeological Alert Areas within Portsmouth based on known sites of archaeological interest. The red alert areas (highest sensitivity) are based on scheduled monuments. The cable route intersects a number of 'yellow' alert areas, which refer to 'locally important monuments of known extent'. Whilst these do not present a planning constraint as such, they are used internally by Hampshire County Council to flag sites for development control purposes. The 'alert' areas beyond Portsmouth Borough were not available for consultation for this Scoping Report; only those within Portsmouth Borough (the southern section of the cable route) have been considered in this Scoping Report. The cable route intersects the following 'yellow' areas:
- Eastney Point;
 - Eastney Farm (Possible medieval manor and homestead);
 - Portsmouth/Arundal Canal (Post-medieval Canal - subsequently infilled);
 - Extent of Milton Manor;
 - Salterns (or saltings; area of coastal intertidal mudflats used in the production of salt, shown on historic mapping); and
 - Hillsea Lines (mid-19th century military inland defenses).

Historic Environment Potential

- 9.1.10 The potential for possible, previously unrecorded archaeological remains, along with above ground remains such as earthworks and undesignated build heritage, will be considered in the ES following the collation and review of a broad range of data sources (see below). This will assess the likely potential, nature, extent, survival and significance of any remains present, and will consider factors which may have compromised survival.
- 9.1.11 The Proposed Development is underlain by varying geology. Much of the cable route is underlain by Head Deposits and Chalk. The southern part of the cable route comprises Sand and Gravels, London Clay, Alluvium and Brickearth. The coastal areas on higher ground (on gravel terraces) may have attracted prehistoric activity, especially the natural promontory at Eastney point. On the basis of the geology and the nearby watercourses and access to Portsmouth Bay and coast, it is likely that the cable route crossed a landscape conducive to early settlement and farming.

9.2 Scope of Assessment

9.2.1 In terms of heritage and archaeology, the ES will comprise above ground and buried heritage assets, including archaeological and paleoenvironmental remains, buildings, structures, monuments and landscapes of heritage interest, within or immediately around the cable route including the landfall site, and the proposed converter station. This includes any temporary construction compounds and access roads. The setting of statutorily designated heritage assets in the vicinity of the proposed converter station, for example views to and from Listed Buildings will form part of the assessment. The specialist assessment would conform entirely to standards set by the Chartered Institute for Archaeologists (CIfA 2014a, 2014b) and other professional guidance (EH 2015).

Likely Significant Effects

9.2.2 The likely significant environmental effects of the construction stage which will be considered in the EIA are as follows:

- Partial or complete loss to buried heritage assets, if present, where ground disturbance is proposed. This might include excavation of the cable trench, topsoil removal within the cable trench 'working width' and for temporary access roads and construction compounds. For the proposed converter station it may also include landscaping, earthworks, planting and building construction;
- Removal of sections of Historic Hedgerows. This assessment will be carried out in close liaison with the Ecology team, to avoid double counting of effects; and
- Temporary impacts on the setting of nearby designated heritage assets at the proposed converter station.

9.2.3 The likely significant environmental effects of the operational stage which will be considered in the ES are as follows:

- Permanent changes to the setting of above ground designated assets within the vicinity of the proposed converter station, due to the presence of permanent above ground structures. This will include consideration of cumulative effects (i.e. the impact of the Proposed Development with other Proposed Developments in the study area).

9.2.4 In terms of considering the setting of designated above ground heritage assets, the scope will include those assets that may be subject to a 'significant' change to their setting in accordance with the stepped approach set out in Historic England guidance on setting (Step 1). This takes into account: the nature and scale of Proposed Development; the fact that the greater the distance a heritage asset is from the Proposed Development, the more diminished the visual effects are likely to be; the location and position of intervening development, infrastructure, vegetation and landscape features; and the location and direction of key views likely to contribute meaningfully to a particular asset's significance. A ZTV will guide the selection of designated assets potentially affected and considered for assessment. There will also be some consideration of the heritage value (if any) of the exiting landscape.

Insignificant Effects

- Operational impacts to buried archaeological remains will not be considered on the basis that there would be no further ground disturbance following completion of the construction stage and no additional archaeological impact;

- The possible impact on the setting of above ground designated heritage assets will not be considered along the cable route and at the landfall on the basis that the works comprise only below ground disturbance. Consequently there would be no effects to the setting of heritage assets. This includes temporary construction stage impacts as these are unlikely to be significant considering the short duration of the construction stage; and
- Cumulative effects in relation to the cable route and landfall. Cumulative effects are 'elevated' effects which occur where the combined effect of the Proposed Development with other Proposed Developments in the vicinity, on a discrete and significant shared asset/resource, is more severe than that reported along the cable route. This is on the basis that for intangible and deeply buried heritage assets it is not feasible to quantify accurately the nature of the resource across the whole study corridor, which would enable the identification of a cumulative impact and potential elevated effect, along with the localised nature of the impact proposed.

9.3 Assessment Methodology

- 9.3.1 The ES will consider both the cable route and the proposed converter station, to allow an integrated and holistic approach to the historic environment, as is best practice. It will set out the planning framework in respect of buried heritage assets (archaeological remains) and above ground heritage assets (structural remains of historic interest including the listed buildings, conservation area, and the scheduled monument) and their setting.
- 9.3.2 It can be difficult to predict accurately the presence and likely significance of buried assets that are not visible, and consequently the impact upon them, based primarily on a desk based sources. The principal source of information is the Berkshire HER. The information provides an initial indication of assets present rather than a definitive list of all potential archaeological assets because the full extent of a buried heritage resource cannot be known prior to site-specific archaeological field investigation. Typically, appropriate standard archaeological evaluation techniques are utilised to reduce the uncertainties inherent in any desk-based assessment, as part of an overall mitigation strategy.
- 9.3.3 The assessment methodology would entail a standard process for EIA, and follows the process similar to that outlined in the Design Manual For Roads and Bridges (DMRB) (Department of Transport, 1992).
- 9.3.4 The heritage and archaeology assessment in the ES would be supported by a fully illustrated Historic Environment Desk Based Assessment (HEDBA). This would put the Proposed Development into its full archaeological and historical context by compiling a detailed baseline through a broad and standard range of data sources, as set out in **Table 9.1**.

Table 9.1: Data Sources

SOURCE	DATA	COMMENT
Historic England	National Heritage List (NHL) with information on statutorily designated heritage assets	Statutory designations (scheduled monuments; statutorily listed buildings; registered parks and gardens; historic battlefields) can provide a significant constraint to development.
Portsmouth City Council	Portsmouth Historic Environment Record (HER)	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots,

SOURCE	DATA	COMMENT
		and documentary and cartographic sources
Hampshire County Council	Hampshire Historic Environment Record (HER)	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources
Hampshire County Council	Archaeological Alert Areas	Areas marked out as having potential archaeological interest, managed by the LPA to flag potential sites.
Local Planning Authority	Archaeological priority area	Area of interest identified by the local authority. There is likely to be a requirement for archaeological investigation (initially a desk-based assessment) as part of any planning application.
Local Planning Authority	Conservation area	An area of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance.
British Geological Survey (BGS)	Solid and drift geology digital map; online BGS geological borehole record data.	Subsurface deposition, including buried geology and topography, can provide an indication of potential for early human settlement, and potential depth of archaeological remains.
Landmark Envirocheck	Ordnance Survey maps from the 1st edition (1860–70s) to present day	Provides a good indication of past land use and impacts which may have compromised archaeological survival. Provides an indication of the possible date of any buildings on the Site.
Portsmouth Local Studies or Hampshire County Archives	Historic maps (eg Tithe, enclosure, estate), published journals and local history	Baseline information on the historic environment (historic mapping, references)
Historic England	Portsmouth Harbour Hinterland Project; Gosport Historic Characterisation Study; National Record for the Historic Environment (NRHE), via Pastscape website.	This recent study may hold information on specific heritage assets within the Site.
Historic England Archive, Swindon	Vertical and specialist (oblique) aerial photographs; the National Mapping Programme data (where available)	Cropmarks formed by moisture variations due to subsurface features can indicate the presence of archaeological remains. Aerial photographs can also sometimes provide information on ground disturbance.
Portable Antiquities Scheme (PAS)	Online data on chance finds.	Where this information has not been incorporated into the HER, it will be reviewed in order to inform the baseline.
WSP Environment Teams	Ecology (Historic Hedgerows and Ancient Woodland); Landscape and Visual (ZTV); Ground Investigation	There will be close liaison with other teams working on the Project to ensure a joined up approach which shares information.
Client team	Existing site survey, geotechnical data	Assists in the appraisal of the likely nature and depth of archaeological remains and the extent of truncation.
Client team	Proposed Development drawings.	Assists in the assessment of the extent of the proposed impact upon known or possible archaeological remains.

Study Area

- 9.3.5 In order to determine the full historic environmental potential of the site, a study area of 500m from the cable route would be examined as part of the EIA. If there are a large amount of results from the HER, i.e. enough to characterise the historic environment potential, this could be reduced to 250m. The size of the study area is based on professional judgement and has been selected in order to provide an understanding of the historic environment potential within the area, possible impacts on known and previously unrecorded archaeological remains, and inform mitigation.
- 9.3.6 For the assessment of impacts to the setting of designated heritage assets in the vicinity of the proposed converter station, a larger study area of 2km would be applied with assets within that study area filtered to a ZTV produced for the Proposed Development.

Site Inspection

- 9.3.7 A site walkover inspection would be carried out at selected accessible locations along the cable route in order to determine the topography of the site and existing land use, and to provide further information on areas of possible past ground disturbance and general historic environment potential. A broader area around the proposed converter station would be inspected in order to assess possible setting impacts.

Site-based Investigation and Mitigation

- 9.3.8 The mitigation strategy would depend on the results of the EIA. Considering the nature of the cable route and the localised impact proposed (i.e. within the cable trench and working width), differing levels of targeted archaeological watching brief are a likely recommendation.
- 9.3.9 Where particularly sensitive assets have been identified, or where the impact is more extensive (e.g. topsoil removal with construction compounds and for the proposed converter station), suitable mitigation will be applied in discussion with the LPAs.
- 9.3.10 In terms of the proposed converter station and possible setting impacts, mitigation normally takes the form of design mitigation (modification of location, materials, massing, screening) in consultation with the engineers, architects, the LPA Conservation Officer, and Historic England (where appropriate).

10 Ecology (with Arboriculture)

This chapter addresses ecology and arboricultural issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs. Bat surveys have been undertaken at the proposed converter station location and are therefore relevant to Winchester City Council and East Hampshire District Council. Wintering bird surveys will be undertaken at the landfall location, therefore is only relevant to Portsmouth City Council. Similarly, otter surveys have been undertaken where the cable route passes the coastline, and is therefore only relevant to Portsmouth City Council. There are some surveys that have been completed across the cable route and are relevant to all LPAs.

Arboricultural surveys have been carried out around the proposed converter station location and will be undertaken for the cable route and landfall location, therefore are relevant to all LPAs.

This chapter uses information obtained from the following sources:

- Freely downloadable datasets from Natural England for statutory designated sites and important habitats⁷;
- Ecological records from Hampshire Biodiversity Information Centre (HBIC);
- Ordnance Survey Master Map, aerial photography and Lidar data, National Tree Map⁸ and habitat classification; and
- Data collected during site surveys conducted by experienced ecologists.

10.1 Baseline Conditions

10.1.1 The scoping boundary includes the footprint of the Proposed Development, including any land required temporarily during the construction stage. The ecological zone of influence of the Proposed Development will depend on the type of works (temporary construction for ducting and cable laying or permanent works relating to the proposed proposed converter station) and the receptors that are encountered.

10.1.2 For biological records, the study area extends beyond the Proposed Development boundaries as follows:

- 10km for Natura 2000 sites, which include SAC, SPA and internationally designated Wetlands of International Importance (Ramsar sites);
- 2km for nationally designated sites, which include SSSI and LNR;
- 1km for non-statutory sites designated for nature conservation value;
- 1km for information regarding Habitats of Principal Importance (HPI)⁹ within 1km and woodland listed on the Ancient Woodland Inventory¹⁰; and
- 1km for records of legally protected and notable species.

⁷ www.natureonthemap.naturalengland.org.uk/ (Accessed 21/09/17)

⁸ <https://www.blueskymapshop.com/products/national-tree-map>

⁹ Mapped locations of HPI are usually not available, but HPI aligns in the most part with UKBAP habitats. Inventories of UKBAP habitat have been prepared by a variety of organisations and at a national (Natural England priority habitat inventory) and local scale (e.g. by local records centres). In some instances these are primarily based on aerial photograph analysis rather than field survey.

¹⁰ The ancient woodland inventory in England lists areas over two hectares in size which have been continuously wooded since at least 1600.

- 10.1.3 A Preliminary Ecological Appraisal (PEA) has been undertaken to inform this Scoping Report. An Extended Phase 1 Habitat Survey was undertaken for areas within the indicative site boundary and broad habitat mapping and identification of ponds (for great crested newts) was undertaken for areas up to 250m from the Proposed Development.
- 10.1.4 An Extended Phase 1 Habitat Survey was undertaken following Joint Nature Conservation Committee (JNCC) guidance (JNCC, 2010)¹¹, on 16th and 17th April 2017. To inform this Scoping Report, the PEA provides a preliminary evaluation of all ecological features within the study area, taking into account guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM)¹². In evaluating the relative importance of ecological features for scoping, the following factors were considered; nature conservation designations, species/habitat rarity, naturalness, fragility, connectivity to other habitats and relevant nature conservation aims and objectives for a given area as contained under the NERC Act (2006) and local biodiversity action plans and planning policies.
- 10.1.5 The following section presents a provisional ecological baseline, informed by a PEA, for purposes of scoping. Further species-specific surveys are ongoing (during 2017) and results of which are not included in this section; however the scope and extents of these additional studies are outlined below.

Proposed Converter Station

- 10.1.6 The proposed converter station is located within agricultural land on the edge the village of Lovedean, Hampshire. The area is mainly composed of arable land with hedgerows and small pockets of woodland, and residential development to the south-east.

Arboriculture

- 10.1.7 The results of a desk study indicate that there are no Tree Preservation Orders or Conservation Areas within the study area nor are there any recordings of ancient or veteran trees.
- 10.1.8 Ancient semi-natural woodland was found within the study area consisting of Crabdens Row to the north-east of the electricity substation and Crabdens Copse to the south-west. The locations of which are shown on **Figure 10.1**.
- 10.1.9 The desk study also indicates that the study area is within the Ordnance Survey 10 kilometre grid reference SU61. This grid reference includes recorded incidences of Chalara Ash Dieback first confirmed in 2014. The disease was also recorded to the north (OS reference SU62), south (OS reference SU60), east (OS reference SU71) and west (OS reference SU51) of the study area in 2014.

Baseline Arboricultural Resources

- 10.1.10 The arboricultural resource within the study area includes a total of 47 trees, 18 groups of trees, eight woodlands and 10 hedges. A breakdown of these features based upon their quality category is included in **Table 10.1** the locations of which can be seen on **Figure 10.1**.

¹¹ JNCC (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit.

¹² CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater and Coastal. CIEEM, Winchester.

Table 10.1: Arboricultural resource and associated BS 5837 Category

CATEGORY	TREE	GROUP	WOODLAND	HEDGE	TOTAL
A	36	3	5	0	44
B	9	8	3	0	20
C	2	7	0	10	19
TOTAL	47	18	8	10	83

Cable Route and Landfall

10.1.11 The cable route between the converter station and the landfall is to be predominantly laid under local and main roads between the landfall site and the converter station. Both local and major roads will be used, passing areas of built up areas and arable habitats in Portsmouth area. The cable route between the converter station and Lovedean substation will go through landplot adjacent to the substation.

10.1.12 The landfall is located at Eastney beach, comprising intertidal mud and sand, a sand/shingle beach with concrete erosion protection and a mosaic of habitats resulting from derelict developments on the landward side; disused buildings, scrub, rough grassland and bare ground. There is a caravan park to the west of the landfall site and Fort Cumberland to the east. The proposed landfall area is adjacent to Eastney Beach Site of Importance for Nature Conservation (SINC), Fort Cumberland SINC and Land West of Fort Cumberland SINC, comprising semi-improved grassland, coastal heathland, shingle and scrub habitats.

Designated Sites

10.1.13 The desk study identified 10 European or internationally designated sites within 10km of the study area and 11 nationally designated sites within 2km. A description of designated sites are detailed in **Table 10.2** and **Table 10.3**.

Table 10.2: European or Internationally designated sites

SITE NAME	SIZE (HA)	DISTANCE (M)	DESCRIPTION	LPA
Solent and Isle of Wight Lagoons SAC	38.1	6,580	The SAC encompasses a series of Coastal lagoons, including percolation, isolated and sluiced lagoons, and includes marshes in the Keyhaven – Pennington area, at Farlington Marshes in Chichester Harbour, behind the sea-wall at Bembridge Harbour and at Gilkicker, near Gosport. The lagoons show a range of salinities and substrates, ranging from soft mud to muddy sand with a high proportion of shingle, which support a diverse fauna.	New Forest District Council
Solent Maritime SAC	11,243.8	Adjacent	The SAC comprises a number of different estuary ecosystems on the south coast of England. Its qualifying features are three Habitats Directive Annex 1 habitats which are primary reasons for selection (estuaries, <i>Spartina</i> swards, Atlantic salt meadows), and another seven Annex 1 habitats which are present but not a primary reason for the site's selection.	Portsmouth City Council Havant Borough Council Chichester District Council
South Wight Maritime SAC	19,866.2	8,178	The South Wight Maritime SAC encompasses a range of reef types on the coast of the Isle of Wight. The site includes some of the most important subtidal chalk reefs in Britain, supporting a diverse range of species in the subtidal and intertidal. Faces and crevices on the limestone reefs	Isle of Wight Council

SITE NAME	SIZE (HA)	DISTANCE (M)	DESCRIPTION	LPA
			and areas of large boulders provide a range of habitats for a number of marine species. Exposed bedrock is extensively bored by bivalves and sponges adding to habitat diversity. A number of nationally scarce seaweed biotopes are also present within the site, and rare fish species are often present in summer months.	
Butser Hill SAC	239.9	5,690	Butser Hill is situated on the east Hampshire chalk which forms part of the South Downs. Much of the site consists of sheep's-fescue – meadow oat-grass (<i>Festuca ovina</i> – <i>Helictotrichon pratense</i>) grassland, and has a range of slope gradients and aspects which influences vegetation composition. A particular feature is its lower plant assemblage; it has a rich lichen flora and also supports the distinctive association of leafy liverworts and mosses on north-facing chalk slopes. This association is very rare in the UK and Butser Hill supports the largest known example. The site exhibits various transitions between semi-natural dry grassland, chalk heath, mixed scrub and yew <i>Taxus baccata</i> woods.	East Hampshire District Council
Portsmouth Harbour SPA/Ramsar	1,249.6	2,120	Portsmouth Harbour SPA, together with the adjacent Chichester and Langstone Harbours SPA, forms one of the most important sheltered intertidal areas on the south coast of England. It is composed of extensive intertidal mudflats and sandflats with seagrass beds, saltmarsh, shallow coastal waters, coastal lagoons and coastal grazing marsh. The estuarine sediments and areas of saltmarsh support rich populations of intertidal invertebrates, which provide an important food source for wintering birds, and also shelter roosting flocks, in particular black-tailed godwit <i>Limosa limosa</i> , dark-bellied brent goose <i>Branta bernicla bernicla</i> , dunlin <i>Calidris alpina</i> and red-breasted merganser <i>Mergus serrator</i> .	Portsmouth City Council Gosport District Council
Chichester and Langstone Harbours SPA/Ramsar	5,811.0	Adjacent	This site encompasses a wide area including two harbours located on the south coast of England in Hampshire and West Sussex. They are large, sheltered estuarine basins comprising extensive areas of sand and mudflat exposed at low tide. The mudflats are rich in invertebrates and also support extensive beds of algae, particularly <i>Enteromorpha</i> species, and eelgrass <i>Zostera</i> spp. The site is of particular value for water birds, especially in migration periods and winter. It also supports important colonies of breeding terns.	Havant Borough Council
Solent and Southampton Water SPA/Ramsar	5,402.0	7,083	The site comprises a series of estuaries and harbours with extensive mud-flats and saltmarshes together with adjacent coastal habitats including saline lagoons, shingle beaches, reedbeds, damp woodland and grazing marsh. The mudflats support beds of <i>Enteromorpha</i> spp. and <i>Zostera</i> spp. and have a rich invertebrate fauna that forms the food resource for the estuarine birds. In summer, the site is of importance for breeding seabirds, including gulls and four species of terns. In winter, it holds a large and diverse assemblage of waterbirds, including geese, ducks and waders. Dark-bellied brent goose <i>Branta b. bernicla</i> also feed in surrounding areas of agricultural land outside the SPA.	New Forest District Council
Solent and Dorset Coast pSPA	87,531.7	Adjacent	The proposal for Solent and Dorset Coast is to create a new SPA for internationally important populations of: <ul style="list-style-type: none"> • common tern • Sandwich tern • little tern 	Arun District Council Chichester District Council Portsmouth City

SITE NAME	SIZE (HA)	DISTANCE (M)	DESCRIPTION	LPA
			This area is particularly important to these birds as much of the sea around their breeding colonies is the ideal habitat for plunge diving for food.	Council Havant Borough Council Gosport District Council Fareham District Council New Forest District Council Christchurch District Council Bournemouth Borough Council Poole Borough Council Purbeck District Council Isle of Wight Council

Table 10.3: Nationally designated sites

SITE NAME	SIZE (HA)	DISTANCE (M)	DESCRIPTION	LPA
Langstone Harbour SSSI	2,085.7	Adjacent	Langstone Harbour is a tidal basin which at high water resembles an almost land-locked lake. The harbour includes one of the largest areas of mixed saltmarsh on the south coast, and extensive cord-grass <i>Spartina anglica</i> marsh in an advanced state of degeneration, is among the twenty most important intertidal areas in Britain as a summer and autumn assembly ground for waders during the moult (when they require abundant high protein food) and as a post-moult wintering ground.	Havant Borough Council Portsmouth City Council
Portsdown SSSI	69.2	423.8	Portsdown is an isolated east-west chalk hillside with a long south-facing escarpment. On the lower south-facing slopes raised beaches mark former sea levels and former wave erosion has removed Tertiary deposits and some of the chalk, leaving very steep slopes. Despite the absence of grazing and extensive disturbance, these slopes still support a rich chalk grassland flora and have a diverse insect fauna.	Fareham District Council Portsmouth City Council
Sinah Common SSSI	243.0	884.3	The site comprises a complex of maritime habitats which extend for over 2km eastwards from the south-western extremity of Hayling Island, Hampshire. Gunner Point at the western end contains the most extensive sand dunes and vegetated shingle beach in Hampshire. It supports shingle beach vegetation and grassland, dune heath, dune grassland, saltmarsh and open water communities. To the east of Gunner Point there is an extensive area of fragmented dune grassland and shingle.	Havant Borough Council
Catherington Down SSSI / LNR	12.8	845.3	Catherington Down is an area of chalk grassland and narrow fringing woodland belts on predominantly west-facing downland slopes near the southern extent of the	East Hampshire District Council

SITE NAME	SIZE (HA)	DISTANCE (M)	DESCRIPTION	LPA
			main Upper Chalk outcrop in Hampshire. About one-third of the area has rather less steep slopes, deeper soils and a turf dominated by coarse grasses. Development of scrub and incipient woodland is more apparent here. A belt of oak <i>Quercus robur</i> woodland forms the lower, woodland boundary, whilst part of the high, eastern edge is covered by a strip of oak standards over old hazel <i>Corylus avellana</i> . This latter woodland is separately fenced and has a typical spring woodland flora which includes, locally associated with hazel, toothwort <i>Lathraea squamaria</i> .	
Catherington Lith LNR	9.22	1,820.1	The site comprises woodland and remnants of chalk grassland, supporting a diverse range of bird and plant species. There are islands of scrub within the open habitats.	East Hampshire District Council
Farlington Marshes LNR	119.7	482.6	The site comprises flower-rich grazing marsh on the northern shore of Langstone Harbour between Portsmouth and Havant. Farlington is important for the bird populations that it supports, as well as being of importance to wild flowers and butterflies. It is managed by the Hampshire and Isle of Wight Wildlife Trust.	Havant Borough Council Portsmouth City Council
Hazleton Common LNR	17.5	1,158.0	A mosaic of heathland, grassland, hedgerow and scrub habitats of importance to wildflowers, birds and reptiles.	East Hampshire District Council Havant Borough Council
The Kench, Hayling Island LNR	6.0	1,264.7	A small area of inter-tidal mud and saltmarsh within Langstone Harbour. This shallow tidal inlet alongside Ferry Road on Hayling Island is used by birds as a feeding area while the tide is out and when it is high the shingle ridge between the inlet and the main harbour is used as a roost by waders.	Havant Borough Council
Yeoll's Copse LNR	5.5	193.1	A woodland site with old coppiced sessile oak and wild service trees. Notable species include common cow wheat and butchers broom.	East Hampshire District Council
Dell Piece West LNR	4.1	1,078.6	The site comprises woodland, unimproved grassland, damp marshy ground and a large shallow pond that provides habitat for a rich variety of wildlife that includes various butterflies, dragonflies and reptiles.	East Hampshire District Council

10.1.14 The desk study identified 43 non-statutory nature conservation sites within 1km of the study area SINC or Road Verges of Ecological Importance (RVEI). A summary of these sites is presented in **Table 10.4**.

Table 10.4: Non-statutory designated sites

SITE NAME	DESIGNATION	SIZE (HA)	DISTANCE (M)	LPA
Newlands Row and Plant Row	SINC	5.35	239.3	Winchester City Council
Crabdens Copse	SINC	1.3	243.7	East Hampshire District Council
James' Copse and Outlier	SINC	5.69	185.2	East Hampshire District Council
Milton Common	SINC	46.13	Adjacent	Portsmouth City Council
Land West of Fort Cumberland	SINC	7.58	Adjacent	Portsmouth City

SITE NAME	DESIGNATION	SIZE (HA)	DISTANCE (M)	LPA
				Council
Newlands Farm Meadow	SINC	3.74	271.4	Winchester City Council
James' Copse Paddock	SINC	1.42	265.4	Portsmouth City Council
Great Salterns	SINC	17.76	275.8	Portsmouth City Council
Great Salterns Lake	SINC	5.1	Adjacent	Portsmouth City Council
Hilsea Lines	SINC	18.05	Adjacent	Portsmouth City Council
Longwood (Idlewood)	SINC	1.15	151	Havant Borough Council
Stakes Coppice Remnant 1	SINC	0.46	454.8	Havant Borough Council
Adjacent to Farlington Playing Fields	SINC	6.59	411.5	Portsmouth City Council
Marrelsmoor Row	SINC	0.69	271.3	Winchester City Council
London Road Fen	SINC	1.91	Adjacent	Havant Borough Council
Purbrook Heath	SINC	3.4	466.4	Winchester City Council
Land to the north of Portsdown Hill Road	SINC	8.49	87.9	Portsmouth City Council
Park Wood, Havant	SINC	2.59	385.9	Havant Borough Council
Crabdens Row	SINC	0.93	293.7	East Hampshire District Council
Meadow west of Farlington Avenue	SINC	1.54	Adjacent	Portsmouth City Council
Fort Purbrook Paddock 2 (Havant)	SINC	0.85	468.6	Havant Borough Council
Fort Purbrook	SINC	5.53	191.8	Havant Borough Council
Rabbit Copse, Horndean	SINC	1.93	435.6	East Hampshire District Council
Melville Road verge	SINC, RVEI	0.04	Adjacent	Portsmouth City Council
Land to the South of Portsdown Hill Road	SINC	0.81	Adjacent	Portsmouth City Council
Wecock Wood	SINC	1.69	117.1	Havant Borough Council
Fort Purbrook Paddock 1 (Havant)	SINC	2.77	354.6	Havant Borough Council
Fort Cumberland	SINC	9.51	Adjacent	Portsmouth City Council
Kings Pond Meadow	SINC	2.69	Adjacent	Winchester City Council

SITE NAME	DESIGNATION	SIZE (HA)	DISTANCE (M)	LPA
Anmore Dell Meadow	SINC	1.61	308.6	Winchester City Council
Wecock Common	SINC	5.54	54.2	Havant Borough Council
Alsfordmoor Coppice	SINC	5.66	479.2	Winchester City Council
Yoells Copse	SINC	5.4	92.2	East Hampshire District Council
Piper's Hill Wood	SINC	1.96	215.2	Winchester City Council
Portsmouth Golf Course West	SINC	2.01	182.6	Havant Borough Council
Field to West of Gillman Road	SINC	2.66	161.7	Portsmouth City Council
Golf Course North of Burrfields Road	SINC	28.13	Adjacent	Portsmouth City Council
East and West of Gillman Road	SINC	11.25	122.2	Portsmouth City Council
Farlington Avenue	SINC, RVEI	0.15	Adjacent	Portsmouth City Council
Baffins Pond	SINC	2.12	433.6	Portsmouth City Council
Farlington Marshes	SINC	122.52	475.9	Portsmouth City Council
Eastney Beach	SINC	18.47	Adjacent	Portsmouth City Council
Marrelsmoor Coppice	SINC	3.05	84.8	Winchester City Council
B2177 Portsdown Hill Road	RVEI	0.60	422.8	Portsmouth City Council

10.1.15 72.79 ha of woodland listed on the National Inventory of Woodland and Trees is present within 1km of the study area. This comprises 35.62 ha of Ancient and Semi-Natural Woodland within Alsfordmoor Coppice, Crabdens Copse, Crabdens Row, Long Wood, Purbrock Park Wood, Rabbit Copse, Stoneacre Copse, Yoells Copse and other unnamed patches of woodland, and 37.17 ha of Ancient Replanted Woodland within James's Copse and The Queens Enclosure.

10.1.16 13 types of Priority Habitat can be found within 1km of the study area, covering 1,392 ha of the landscape. Habitat types cover those associated with coastline (grazing marsh, sand dunes, mudflats), woodland and calcareous hillsides amongst others.

Habitats

10.1.17 Phase 1 habitat types¹³ identified using pre-classification mapping and recorded during the Phase 1 habitat survey are described in the context of the three main

¹³ JNCC (2010). Handbook for Phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough.

elements of the scheme (landfall; cable route; and proposed converter station) below in **Tables 10.5, 10.6 and 10.7.**

Table 10.5: Landfall Habitat Descriptions (Portsmouth)

HABITAT TYPE	JNCC CODE	DESCRIPTION
Scrub	A2	Scattered scrub was recorded both around Fraser Range and within Land West of Fort Cumberland SINC, which are present in the adjacent areas surrounding the landfall. Common scrub species recorded include bramble <i>Rubus fruticosus</i> agg. and gorse <i>Ulex europaeus</i> .
Semi-improved grassland	B2.2	The main areas of semi-improved, low nutrient grassland within the landfall area was recorded within Land West of Fort Cumberland SINC, with species including yellow rattle <i>Rhinanthus minor</i> , viper's bugloss <i>Echium vulgare</i> , kidney vetch <i>Anthyllis vulneraria</i> and bird's foot trefoil <i>Lotus corniculatus</i> . The SINC is also noted for the presence of dittander <i>Lepidium latifolium</i> , Countyscarce sea radish <i>Raphanus raphanistrum maritimus</i> and, of National Interest, autumn lady's-tresses <i>Spiranthes spiralis</i> .
Intertidal – shingles/cobbles	H1.2	The beach at the landfall is generally comprises a long, wide and continuous shingle beach with associated promenade and parking, and landward development including barracks, a caravan park and disused military ranges. Colonising vegetation such as sea kale <i>Crambe maritima</i> and sea beet <i>Beta vulgaris</i> and fennel <i>Foeniculum vulgare</i> were recorded. Nationally scarce Nottingham catchfly is known to be present on more stable parts of the beach near the caravan park; however was not recorded during the survey. Coastal vegetated shingle habitats qualify as a Habitat of Principal Importance.
Amenity grassland	J1.2	The majority of amenity grassland present within the landfall site was recorded at Southsea Leisure Park, interspersed between static caravan plots.
Built-up areas	J3	The landfall and cable route passes through built up environs of a former military range, Fraser Range. This derelict nautical gunnery comprised a series of flat roofed structures and hardstanding, with scattered scrub and grassland colonising in dilapidated surfaces.
Hard standing	N/A	The majority of hard standing is present in Frasers Range. The cable route then follows the access track, which joins Fort Cumberland Road at the bareground carpark of Land West of Fort Cumberland SINC. At this point, the cable route passes the northern end of Melville Road, where the Road Verge is designated as a SINC for the presence of the County Scarce sea radish.

Table 10.6: Cable Route Habitat Descriptions

HABITAT TYPE	JNCC CODE	DESCRIPTION
Scattered trees	A3.1	Scattered trees were recorded along the entire proposed cable route. Whilst the route is generally confined to the path of existing infrastructure, tree-lined roads were mainly noted at Bransbury Park, Milton Park, Milton Cemetery, Milton Common (SINC), Southsea Golf Course (SINC), Interchange Park and Airport Industrial Estate, Walton Road Industrial Estate, Mountbatten Business Park, Residential roads at Drayton, roads adjacent to Meadow west of Farlington Avenue (SINC) and tree lined roads at Widley.

HABITAT TYPE	JNCC CODE	DESCRIPTION
Semi-improved grassland	B2.2	Grassland fields were noted in association with the western sub-option, where the route leaves the B2150. Access to these fields was not possible at the time of survey; however Priority Habitat records suggests that fields in this locality are lowland meadows with an affinity to MG5.
Running water	G2	The western sub-option crosses, what appears to be running water, as the route diverts off Hambledon Road. This watercourse was not accessed at the time of survey as permission was not granted. From Ordnance Survey, the watercourse resembles an agricultural drain.
Intertidal mud/sand	H1.1	Main areas of intertidal habitats that interface the Proposed Development are located within the Solent Maritime SAC, Chichester and Langstone Harbours Ramsar Site and Langstone Harbours SSSI. Although the route does not intersect this habitat, the cables follow the A2030 Eastern Road, which runs parallel to the intertidal habitats before crossing the harbour on an existing road bridge before joining the A27 Havant Bypass. Mudflats are exposed at low tide and are generally rich in invertebrates and may support important plant communities and bird assemblages.
Arable	J1.1	The western sub-option of the cable route crosses intensively farmed arable fields before reaching the proposed converter station location at Lovedean. Arable fields, at the time of survey, had recently been ploughed and drilled.
Hedges	J2	The proposed cable route crosses a series of hedges which were not accessed for survey due to permissions. These are located on the western sub-option where the cable cuts across semi-improved
Built-up Areas	J3	The proposed cable route is almost entirely urban with exception of the western sub-option, which leads the final leg of the route through an agricultural landscape before connecting with the proposed converter station at Lovedean. The Cable route follows built up, urban areas around Portsmouth, including Eastney, Milton, Ancorage Park, Drayton, Purbrook and Waterlooville.
Hard standing	N/A	The majority of the route is within hard standing areas of existing highways, including the A288, A2030, Farlington Avenue, B2177, A3, B2150, Milton Road, Lovedean Lane and Day Lane.

Table 10.7: Proposed Converter Station Habitat Descriptions

HABITAT TYPE	JNCC CODE	DESCRIPTION
Semi natural broadleaved woodland	A1.1.1	Parcels of semi natural broadleaved woodland are present to the east and south of the proposed converter station. Dominant species include ash <i>Fraxinus excelsior</i> , hazel <i>Corylus avellana</i> , elder <i>Sambucus nigra</i> and beech <i>Fagus sylvatica</i> . A dense cover of ivy <i>Hedera sp.</i> was also recorded on the ground and on some trees, particularly on the embankments adjacent to the proposed converter station to the south. In the woodland to the west, the ground flora comprised wood anemone <i>Anemone nemorosa</i> , ramsons <i>Allium ursinum</i> and bluebell <i>Hyacinthoides non-scripta</i> .
Plantation woodland	A1.1.2	A stand of plantation woodland, comprised predominantly mature and semi mature sycamore <i>Acer pseudoplatanus</i> is present to the eastern extent of the proposed converter station. A second parcel of this habitat was recorded to the west. Trees in this parcel had been recently planted
Poor semi-improved neutral grassland	B1.6	Poor semi improved neutral grassland was recorded in three fields to the west and south of the proposed converter station. Species present include red fescue <i>Festuca rubra</i> , Yorkshire fog <i>Holcus lanatus</i> perennial rye grass <i>Lolium perenne</i> , cocks foot <i>Dactylis glomerata</i> , and white clover <i>Trifolium repens</i> .

HABITAT TYPE	JNCC CODE	DESCRIPTION
		Sward height was approximately 30cm.
Improved grassland	B4	Improved grassland was present in fields to the west of the proposed converter station. Horses were noted to be grazing in one field to the south. Dominant species are perennial rye grass, dock and sorrel <i>Rumex acetosa</i> . Sward height was approximately 20cm.
Tall ruderal	C3.1	Tall ruderal vegetation is present in a number of locations, particularly along field boundaries. Species present include nettle <i>Urtica dioica</i> dock <i>Rumex obtusifolius</i> and bramble <i>Rubus</i> sp.
Arable	J1	Arable fields were noted to the north and south of the proposed converter station. The fields to the north were ploughed; to the south recently planted crops were present.
Species-poor hedgerow	J2.2	A number of hedgerows were present at the site, particularly marking field boundaries to the west. Dominant species include blackthorn <i>Prunus spinosa</i> , hawthorn <i>Crataegus rhipidophylla</i> , bramble and hazel. Hedgerows to the north appeared recently managed.
Hedgerow with trees	J2.3	Hedgerows with trees were present to the north of the sites. Dominant species include oak <i>Quercus robur</i> , ash, elder, hawthorn, blackthorn and sycamore.

Protected and Notable Species

10.1.18 The potential for the Proposed Development to support legally protected species and notable species has been assessed using the results of the desk study and observations made during the site survey of habitats within and immediately surrounding Eastney Beach landfill site, the proposed high voltage cable route and the proposed converter station location.

10.1.19 The following species may occur within the survey area:

- Bats;
- Badger;
- Otter;
- Water vole;
- Dormouse;
- Breeding Birds;
- Wintering and Passage Birds;
- Reptiles;
- Great Crested Newt; and
- Invertebrates.

Bats (all LPAs)

10.1.20 The desk study returned records of six bat species within the study area, which comprised 97 individual bat records. This included records for serotine *Eptesicus serotinus*, brown long-eared *Plecotus auritus*, noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and whiskered bat *Myotis mystacinus*.

10.1.21 Habitats in the survey area, including buildings and trees (both scattered and those occurring within woodland and hedgerows), have the potential to support roosting

bats. Ancient woodlands surrounding the Lovedean substation and associated hedgerows are suitable to support roosting foraging and commuting bat species, including Bechstein's bat *Myotis bechsteinii*, which are known to be in the County. The vast majority of Bechstein bat records are associated with the Forest of Bere, a large area of ancient woodland and Forestry Commission site 3km southeast of Lovedean. There are also records immediately east of the Forest of Bere towards the A3 motorway.

Badger (Winchester City Council and East Hampshire District Council)

10.1.22 Four records of badger *Meles meles* were returned from the desk study with the most recent one recorded in 2009. Habitats within the survey area, including semi-natural woodland, dense scrub, hedgerow and the golf course are suitable for supporting foraging and sheltering badger. Badger activity, including main and annex setts, latrines and paths were recorded in proximity to the proposed converter station.

Otter (Portsmouth City Council)

10.1.23 No records of otter *Lutra lutra* were returned from the desk study. However, suitable habitat for this species, including foraging, commuting, and sheltering habitat, is present in the survey area, particularly within the coastal area along the A2030 and the Farlington Marshes, which are unlikely to be affected by the Proposed Development.

Water vole (Portsmouth City Council)

10.1.24 There were five records of water vole *Arvicola amphibius* recorded within the study area. The most recent record was reported in 2012. The survey area crosses an unnamed watercourse north of the B2150. The survey area is also bordered by Farlington marshes where the five records were reported; however the cable route is understood to be drilled through this section.

Dormouse (all LPAs)

10.1.25 There are 18 records of hazel dormouse *Muscardinus avellanarius* recorded within the study area, the most recent record was returned from 2012. Habitats within the survey area, including the hedgerows, small and larger areas of woodland east of the A3 London road and north-west of Waterlooville, offer suitable foraging and sheltering habitat for dormice. Scrub habitats connected to these areas are also likely to offer suitable habitat for this species.

Other mammals (all LPAs)

10.1.26 The desk study returned records of other notable mammal species, including hedgehog, brown hare, and common seal. Habitats within the survey area, including areas of woodland, hedgerow, semi-improved grassland, arable land, and coastal area offer suitable foraging and sheltering habitat for these species.

Breeding Birds (all LPAs)

10.1.27 The desk study returned 147 species of bird within the study area. Eighty eight of these species are listed under Schedule 1 of the Wildlife and Countryside Act 1981, including amongst others: little ringed plover *Charadrius dubius*, osprey *Pandion haliaetus*, common crossbill *Loxia curvirostra*, Dartford warbler *Sylvia undata*, firecrest *Regulus ignicapilla*, kingfisher *Alcedo atthis*, hobby *Falco subbuteo*, barn owl *Tyto alba*, red kite *Milvus milvus*, bittern *Botaurus stellaris*, woodlark *Lullula arborea*. Thirteen of the 147 species are listed as Priority Species on S41 of the

NERC Act and five of which are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Records of tawny owl *Strix aluco*, barn owl, kestrel *Falco tinnunculus* and little owl *Athene noctua* were found in areas around the landfill and Fort Cumberland.

- 10.1.28 Habitats within the survey area, including woodland, scrub, hedgerow and coastal habitats are likely to support a range of breeding birds, including those listed on Schedule 1 of the WCA and Priority Species. In addition, the residential areas which support buildings and gardens are likely to support breeding birds which have become habituated to the shelter and foraging opportunities provided by suburban environments. Trees north of the study area have the potential to support nesting barn owl.

Wintering and Passage Birds (Portsmouth City Council)

- 10.1.29 Coastal areas including intertidal mudflats, marsh habitats and high tide roosts sites, which can be shingle, marsh or even inland fields, present important habitats for wintering bird assemblages associated with the neighbouring SPA and Ramsar sites. These species include species such as black-tailed godwit, dark-bellied brent goose, dunlin, red-breasted merganser, oyster catcher *Haematopus ostralegus*, redshank *Tringa totanus* and curlew *Numenius arquata*.
- 10.1.30 The Phase 1 Habitat survey was undertaken at a sub-optimal time to record waders and wintering birds; however habitats were identified as part of the desk study and Phase 1 Habitat survey where areas, in relation to the Proposed Development, were considered to be important in forming an ecological network of sites used by wintering and passage birds associated with the SPA and Ramsar wetlands in the area.

Reptiles (all LPAs)

- 10.1.31 The desk study returned records of two reptile species within the study area: common lizard *Zootoca vivipara* (nine records) and slow-worm *Anguis fragilis* (eight records). Habitats within the survey area, including tussocky grassland and scattered scrubs in the Southsea beach, woodland and dense scrub west of the junction of the A3 with the B2177, the golf course north-east of the junction offer suitable habitat for common species of reptiles. Grassland fields and associated margins northeast of the B2150 present habitats suitable to support reptile species.

Great Crested Newt (all LPAs)

- 10.1.32 The desk study returned four records of great crested newt *Triturus cristatus* within the study area; the most recent record is from 2015 in the Purbrook area. Nine standing waterbodies (ponds) were identified within 250m of the Proposed Development.
- 10.1.33 The Natural England rapid risk assessment has been undertaken for each of the ponds and is reported, along with X,Y co-ordinates and distance from the scheme in **Table 10.8**. Areas of suitable habitat that are within 250m of the waterbodies listed may therefore support sheltering or foraging great crested newts, if breeding within the waterbodies.

Table 10.8: Ponds within 250m of the Proposed Development.

WATERBODY ID	X	Y	DISTANCE FROM PROPOSED DEVELOPMENT (M)	RISK ASSESSMENT RESULT ¹⁴
7	467510	101131	65	Amber
8	467244	102535	220	Green
15	467570	102841	105	Amber
24	467627	104512	130	Amber
27	467676	104462	170	Amber
38	467449	101335	35	Amber
48	467766	105836	50	Amber
58	466667	110779	200	Green
59	468397	113196	5	Amber

Other Amphibians (all LPAs)

10.1.34 The desk study returned three records of common toad *Bufo bufo*. This species is listed as Priority Species on S41 of the NERC Act Section. Habitats within the survey area, including woodland, scrub, semi-improved grassland and coastal habitats are likely to support common toads.

Invertebrates (all LPAs)

10.1.35 The desk study returned a large number of invertebrate records, including records of species which are listed on Section 41 of the NERC Act. Habitats within the survey area, including woodland, scrub, semi-improved grassland and inter-tidal habitats, are likely to support invertebrates, including notable species.

10.2 Scope of Assessment

Designated Sites

10.2.1 The Habitats Regulations provide strict protection to sites of European and/or international importance. This includes requiring projects or plans to be screened for likely significant effects upon SPA, SAC and candidate SACs (cSACs). Guidance also requires potential SPAs (pSPAs) and Ramsars are subject to the same assessment. Therefore, due to the presence of Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar and Solent and Dorset Coast SPA, the Proposed Development must be screened by the Competent Authority as part of a HRA. In this instance, the LPA are the Competent Authority who will determine whether likely significant effects on the designated sites are anticipated. If the Competent Authority is unable to conclude that likely significant effects are not likely, the Proposed Development must be subject to additional assessment in accordance with the Habitats Regulations.

10.2.2 Based on the current design and indicative areas required for construction, it is understood that the following SINC (relevant LPA identified in **Table 10.4**) are likely

¹⁴ Green: offence highly unlikely; Amber: offence likely; Red: offence highly likely.

to be affected by the Proposed Development through disturbance, hydrological change, pollution effects or direct land-take:

- Eastney Beach SINC: the cable route will make landfall through this site;
- Land West of Fort Cumberland SINC: Transition Joint Bay is currently located within this area;
- Melville Road Verge SINC and Road Verge of Ecological Importance (RVEI): Cable route following Fort Cumberland Road is connected to Melville Road to the south;
- Milton Common SINC, Great Salterns Lake SINC, Golf Course North of Burrfields Road SINC, Hilsea Lines SINC: Cable route runs immediately adjacent to these sites along Eastern Road;
- Farlington Avenue SINC and RVEI, Meadow West of Farlington Avenue SINC: The cable route is located immediately adjacent to these sites on Farlington Avenue;
- London Road Fen SINC: A small section of the SINC is located immediately adjacent to London Road, along which the cable route is located;
- Kings Pond Meadow SINC: Where the cable route diverts off Hambledon and intersects fields before crossing this site east of Denmead; and
- Crabdens Copse and Crabdens Row SINC: The proposed converter station and associated works have potential to be located in close proximity to these sites, which surround the National Grid Substation.

10.2.3 SINC are generally designated and managed by the County Council on behalf of a Biodiversity Partnership including Wildlife Trusts. Once further design details are known, site-specific ecology surveys will be undertaken to better understand the biodiversity context and value of the site and location and types of ecological receptors present in context of the anticipated impacts. This study will enable an assessment to be made of the conservation value of the site such that appropriate mitigation to be designed. The study will include:

- Consultation and site visits with the County Ecologist where appropriate;
- Habitat types affected and their conservation status;
- Species likely to be affected and their conservation status;
- Ecological connectivity and landscape context of the site; and
- Mitigation strategy and recommendations.

10.2.4 No negative effects are envisaged on all other designated sites identified in the study area.

Habitats (all LPAs)

10.2.5 A number of habitats identified as HPI in accordance with S41 of the NERC Act 2006 have been identified within the study area. Under Section 40 of this legislation, every public body (including planning authorities) must, *'in exercising its functions, have regard so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'*.

10.2.6 The landfall may directly affect areas of Coastal Vegetated Shingle HPI. Coastal vegetated shingle habitats are extremely fragile and excavation and construction access is likely to degrade the site through loss of vegetation and incorrect reinstatement and management, resulting in lack of regeneration. The impacts on this habitat resulting from the landfall will need to be further investigated once construction measures are known and the precise location is identified. Any landfall design should avoid//minimise direct effects on this habitat and any work in this area

should be carried out under an appropriate method statement, which should be informed by a detailed survey of the area.

- 10.2.7 The western sub-option of the Cable Route directly affects areas of lowland meadow, north of the B2150. This habitat is also a SINC (Kings Pond Meadow SINC).
- 10.2.8 Lowland Mixed Deciduous Woodland habitats surround the existing National Grid Sub-station. The proposed converter station site should seek to avoid these habitats and retain a c.15-30m buffer from the boundary of any development.

Bats (all LPAs)

- 10.2.9 Construction activities, if undertaken at night, may affect bats foraging and commuting within and adjacent to the survey area. This is most likely within the vicinity of hedgerows, areas of woodland adjacent to the scheme.
- 10.2.10 Where the proposed converter station will be constructed, hedgerows, scrub and woodland might be damaged or removed for the purpose of the works. These may support suitable habitats for foraging and commuting bats, which would result in potential disturbance, fragmentation and severance effects.
- 10.2.11 There are a number of trees within the Proposed Development which may be damaged or require removal during construction. These trees may be suitable for supporting roosting bats.
- 10.2.12 Bat activity surveys are underway to identify commuting routes and foraging areas where hedgerows, scrubs and woodlands may be damaged or removed during the construction of the proposed converter station, within the proposed permanent work areas.
- 10.2.13 A survey to identify Potential Roost Features (PRF) will be undertaken for trees and/or buildings which will be removed, damaged or disturbed during construction of the Proposed Development.

Badger (East Hampshire District Council and Winchester City Council)

- 10.2.14 Where works are focused within the existing highway areas, it is not likely that badger setts will be found or disturbed. However where works cross fields (west of Waterlooville, in East Hampshire District Council) and where the proposed converter station will be constructed, suitable habitats for badger setts may be affected. The presence of workers and work activity may also discourage badger from moving through the area, particularly if works are undertaken at night.
- 10.2.15 A badger survey will be undertaken in these areas and based on the results of this survey, appropriate mitigation for badger will be designed.

Otter (Portsmouth City Council)

- 10.2.16 Otter may be present within the vicinity of the coastal area along the A2030 and the Farlington marshes. Works within the vicinity of these areas could disturb otters if a holt is present within the near vicinity of works. The presence of workers and work activity may also discourage otter from moving through the area, particularly if works are undertaken at night. It is however understood that the cable route will avoid any effects to these habitats through directional drilling. Should the route deviate from these proposals, otter surveys may be required.

Water vole (*Portsmouth City Council*)

10.2.17 Water vole may be present within the vicinity of the unnamed watercourse north of the B2150 crossed by the scheme, and the vicinity of the Farlington marshes. Works within the vicinity of the Farlington marshes will be on roads and is not likely to disturb water vole and /or damage their burrows. However where works cross the unnamed watercourse, water voles could be disturbed and displaced if burrows are present within the near vicinity of works.

Dormouse (*all LPAs*)

10.2.18 The hedgerow, woodland, and scrub habitat within the study area may support dormice. Land-take and vegetation removal north of the scheme required to facilitate the construction may affect these habitats and dormice if supported within them. Surveys to confirm presence or likely absence of dormice in areas where hedgerows, scrub or woodland will be affected or severed is currently underway. Based on the results of this survey, appropriate mitigation for dormouse will be designed and the need for any licensing will be identified.

Breeding Birds (*all LPAs*)

10.2.19 A large proportion of the study area may support breeding birds, including areas of woodland, scrub, hedgerow, coastal areas and residential areas. Breeding birds may be affected by vegetation removal during construction, if undertaken during the bird breeding season (generally between March and July).

10.2.20 Construction adjacent to intertidal areas and surrounding SPA and Ramsar sites may give rise to disturbance effects on nesting birds such as common tern, little tern, Mediterranean gull, roseate tern and sandwich tern.

10.2.21 To assess the likelihood of disturbance, resulting from construction, of nesting bird species associated with European designated sites, screening for HRA will be undertaken.

Wintering and Passage Birds (*Portsmouth City Council*)

10.2.22 During the non-breeding season, the main impacts of construction is disturbance to birds resulting in the interruption of foraging and, to a lesser extent, roosting. The extent to which disturbance affects the actual distribution of birds within a site will vary according to the species involved, the availability of other resources and the birds. There are a number of SPA and Ramsar sites adjacent to the Proposed Development where their qualifying features comprise the assemblage of wading and wintering birds present. Furthermore, a number of suitable fields exist across the proposed cable route suitable to support roosting, loafing and foraging during high-tide.

10.2.23 Winter bird surveys are currently underway (2017-2018) to include the landfall, the cable route where SPA, Ramsar sites and intertidal habitats are in close proximity, and identify potential high-tide roosting areas in close proximity to the scheme where disturbance during construction may arise.

Reptiles (*all LPAs*)

10.2.24 Habitats within the Proposed Development, including tussocky grassland and scattered scrubs, woodland and dense scrub offer suitable habitat for common

species of reptiles. However construction activities close to these areas will be restricted to roads and it is not anticipated that these habitats will be directly affected and reptiles supported within them will be disturbed.

- 10.2.25 Where the Proposed Development affects areas of rough grassland and edge habitats suitable to support reptile species, controls to safeguard the species are likely to result in a temporary displacement effect.

Great crested newt (*all LPAs*)

- 10.2.26 Great crested newts may be present within suitable terrestrial habitat within 250m of a breeding pond. For all parts of the Proposed Development where an offence is likely, a Habitat Suitability Index Survey and eDNA survey for associated ponds within 250m have been undertaken and will be further assessed as part of the EIA.

Invertebrates (*all LPAs*)

- 10.2.27 Notable terrestrial invertebrate species are likely to occur in HPI areas whilst notable macroinvertebrate species are likely to be present in intertidal habitats. Given the temporary nature of construction at the landfall and cable route, it is unlikely that the conservation status of invertebrate species will be affected. Furthermore, it is understood that the cable route is likely to remain within the existing road, thereby avoiding impacts on HPI and notable invertebrate species. Where this is not the case, further survey work may be required to inform an appropriate mitigation strategy.

Arboriculture (*all LPAs*)

- 10.2.28 The assessment will provide details of a desk based study highlighting any statutory and non-statutory considerations in relation to trees within the study areas and to provide a plan showing their locations. This plan will also show trees as recorded during a tree survey which in the case of the proposed converter station has been carried out in accordance with BS 5837. The remainder of the cable route and landfall will be the subject of a desk based assessment and site constraints survey which will be undertaken in September and October 2017.
- 10.2.29 The study area is defined as all land up to 15m beyond the site boundary. This has been identified as the maximum area within which trees may be directly influenced by the Proposed Development and accounts for the Root Protection Area (RPA) associated with any trees located outside of the Site.

10.3 Assessment Methodology

- 10.3.1 Survey methodologies will be in accordance with current good practice guidelines¹⁵.
- 10.3.2 Screening for HRA will be carried out to identify potential Likely Significant Effects on European Designated Sites. The Stage 1 Screening Assessment will be undertaken in accordance with the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC¹⁶. Natura 2000 sites include SPAs and SACs as well as cSACs, pSACs and Sites of Community Importance (SCIs) which have been adopted by the EC, but

¹⁵ <https://www.cieem.net/technical-guidance-series-tgs/> (Accessed 23/06/17)

¹⁶ European Commission (2001). Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. [online]. Office for Official Publications of the European Communities.

not yet formally designated by the government of Member State. In the UK it is a matter of policy that Ramsar sites are also considered by an assessment when a plan/project could result in likely significant effects upon a site.

- 10.3.3 The methodology for the Ecological Impact Assessment will follow guidance issued by the CIEEM¹⁷.
- 10.3.4 The Ecological Impact Assessment will fulfil the following stages as necessary for the Proposed Development:
- Determine the importance of ecological features affected, through survey and/or research;
 - Assess impacts potentially affecting important features;
 - Characterise the impacts by describing their extent, magnitude, duration, reversibility, timing and frequency;
 - Identify cumulative impacts;
 - Identify significant effects of impacts in the absence of any mitigation;
 - Incorporate measures to avoid and mitigate (reduce) these impacts;
 - Assess the significance of any residual effects after mitigation;
 - Identify appropriate compensation measures to offset significant residual effects; and
 - Identify opportunities for ecological enhancement.

Arboriculture

Desk Study Methodology

- 10.3.5 An arboriculture desk studies will be undertaken to identify the presence or otherwise of any statutory controls or other designations which may have relevance to trees within the study area. The following information sources will be used used:
- East Hampshire District Council;
 - Portsmouth City Council;
 - Forestry Commission – Chalara (*Hymenoscyphus fraxineus*);
 - Natural England Magic Maps; and
 - Woodland Trust – Ancient Tree Hunt Interactive Map.

Tree Survey Methodology

- 10.3.6 There are further arboricultural surveys to be undertaken. Where not already undertaken, the tree survey will be carried out in accordance with BS 5837 and categorised in accordance with BS 5837 Table 1.
- 10.3.7 Hedges will be recorded where they formed distinct visual features.
- 10.3.8 In all instances the trees will be inspected using the Visual Tree Assessment methodology as purported by Mattheck and Breoler (Mattheck & Breoler, 2006). The tree survey will be carried out from ground level only.
- 10.3.9 No tissue samples will be taken. In all instances no internal investigation of the subject trees are undertaken.

¹⁷ CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

10.3.10 Tree heights will be estimated to the nearest 1 with their canopies estimated and average spread recorded.

10.3.11 Stem diameters are measured in accordance with Annex C of BS 5837. Root Protection Areas are calculated as an area equivalent to a circle with a radius 12 times the stem diameter.

10.3.12 To allow the assessment of trees on site to be completed in a practicable way and to best reflect the tree population on site, where trees form groups either aerodynamically, through mutual support or by forming a screen or other such feature they are recorded as such.

11 Socio-economics

This chapter addresses socio-economics in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

11.1 Baseline Conditions

Proposed Converter Station

- 11.1.1 The proposed converter station will be located within either Winchester City Council or East Hampshire District Council. The closest settlement is Lovedean (part of the wider urban area of Waterlooville) to the south and east of the proposed converter station. There are wider scattered farmsteads and hamlets to the north and west.
- 11.1.2 At present, there are limited employment opportunities associated with the Proposed Development due to the existing use as substation. The estimated resident population of Winchester is 122,000 and 118,000 in East Hampshire as of 2016. The proportion of individuals aged 16-64 who are economically active is 79.3% in Winchester, which is similar to the proportion in East Hampshire (79.5%). These are lower than the regional average (81.0%), though higher than the average across Great Britain (77.8%).
- 11.1.3 The job density levels (i.e. the ratio of total jobs to the population aged 16-64 in 2015) in Winchester is 1.29 whereas in East Hampshire it is 0.84. The level in Winchester is higher than the averages across the South East Region (0.86) and Great Britain (0.83), whereas the level in East Hampshire is lower. This indicates a greater availability of employment opportunities within Winchester and a lower availability across East Hampshire.
- 11.1.4 In Winchester and East Hampshire, Services is the largest employment sector, accounting for 90.1% and 83.8% of the employee jobs respectively (as of 2015). However, in East Hampshire there are a greater proportion of jobs in the Manufacturing sector at 9.3%, compared within in 5% in Winchester, 6.2% across the South East Region and 8.3% across Great Britain.
- 11.1.5 The educational profile of Winchester indicates that 50.6% of the resident population aged 16-64 have achieved a qualification equivalent or higher than National Vocational Qualification (NVQ) Level 4. Within East Hampshire, the proportion of the resident population aged 16-64 is 43.8%. Both of these local authorities are higher than the the regional (41.4%) and national (38.2%) averages (NOMIS, 2018).
- 11.1.6 The 2011 Census suggests that the health of the population within Portsmouth is generally good with 47.7% of the resident population within Portsmouth considering themselves to be in 'very good health' and 34.8 % to be in 'good health', which compares national figures of 47.2% and 34.2% respectively (Neighbourhood Statistics, 2011).
- 11.1.7 There are no formal public open spaces within or adjacent to the proposed converter station.

Cable Route and Landfall

- 11.1.8 The cable route and landfall crosses Portsmouth City Centre, Havant District Council, Winchester City Council and East Hampshire District Council. The cable route runs

through a mixture of rural and urban areas, including number of settlements such as Anmore, Waterlooville, Purbrook, Widley, Farlington and Portsmouth.

- 11.1.9 At present, there are limited employment opportunities associated with the cable route and landfall due to the existing land use (agricultural land / roads). The estimated resident population of Portsmouth was 214,800, Havant was 123,600, Winchester was 122,000 and 118,000 in East Hampshire as of 2016. The proportion of individuals aged 16-64 who are economically active is 79.3% in Winchester, which is similar to the proportion in East Hampshire (79.5%). However, the proportion in Portsmouth (76.3%) and Havant (59.2%) is lower. These are lower than the regional average (80.8%) (April 2016 – March 2017).
- 11.1.10 The job density levels (i.e. the ratio of total jobs to the population aged 16-64 in 2015) in Winchester is 1.29 which is higher than Portsmouth (0.85), East Hampshire (0.84) and Havant (0.69). The level in Winchester is higher than the averages across the South East Region (0.86) and Great Britain (0.83). This indicates a greater availability of employment opportunities within Winchester compared with the other local authorities and the regional and national averages. In Portsmouth, Havant, Winchester and East Hampshire, Services is the largest employment sector.
- 11.1.11 The educational profile of Winchester indicates that 50.6% of the resident population aged 16-64 have achieved a qualification equivalent or higher than National Vocational Qualification (NVQ) Level 4. Within East Hampshire, the proportion of the resident population aged 16-64 is 43.8%. Both of these local authorities are higher than the the regional (41.4%) and national (38.2%) averages (NOMIS, 2018). Conversley, the proportion of the population within Portsmouth is 34.7% and in Havant is 37.%, both of which are lower than the regional and national averages.
- 11.1.12 The 2011 Census suggests that the health of the population within the local authorities is mixed compared with national figures of 47.2% and 34.2% respectively (Neighbourhood Statistics, 2011). Within Portsmouth, 47.7% of the resident population within Portsmouth considering themselves to be in 'very good health' and 34.8 % to be in 'good health'. However, within Havant, 44.3% of the resident population considered themselves to be in 'very good health' and 35.9% considered themselves to be in 'good health'. For Winchester, 53.2% considered themselves to be in 'very good health' with 32.8% considered to be in 'good health'. For East Hampshire, 50.5% classified themselves as in 'very good health', with 34.7% in 'good health'.
- 11.1.13 There are formal and informal recreational / public open spaces within the vicinity of the cable route and landfall, including Zetland Field, Farlington Recreation Ground, Farlington Marshes, Great Salterns Recreation Ground, Milton Common, Milton Cemetery, Milton Park, Bransbury Park and Eastney Esplanade.

11.2 Scope of Assessment

Insignificant Effects

- There are no private assets within the Proposed Development (e.g. residential properties, commercial / industrial properties) aside from agricultural land – which will be taken into consideration in the Soils and Land Use assessment. As such, effects related to private or community assets will not be considered further within the socio-economics ES chapter;
- Whilst temporary and partial closures of the roads surrounding the Proposed Development may be required for health and safety purposes and for access

purposes during the construction stage, there is not anticipated to be a significant reduction in traffic / footfall and associated disruption to local businesses due to the anticipated delivery / implementation of appropriate traffic management measures. In addition, the disruption associated with the construction of the cable and landfall is likely to be temporary and short-term in nature. Therefore, disruption to local businesses will not be considered further in the ES;

- The site security arrangements for the Proposed Development during the construction stage will be in line with the requirements set out in the Construction (Design and Management) Regulations 2015 and appropriate levels of security (e.g. Close-Circuit Television (CCTV)) alongside design measures (e.g. appropriate fencing) will be provided during operation. Therefore, there is unlikely to be significant effects in relation to crime and this will not be considered further within the ES;
- Community severance is defined '*as the separation of residents from facilities and services they use within their community*'. In accordance with DMRB guidance, community facilities are taken to include doctor's surgeries and hospitals, aged persons homes, primary and secondary schools, dentists, churches, parish halls, recreational areas and leisure facilities, libraries and railway and bus stations. These facilities are concentrated within the urban area around the Proposed Development and, therefore, is unlikely to cause a significant separation of residents from community facilities. In addition, the disruption associated with the construction of the cable and landfall is temporary and short-term in nature. Therefore, effects in relation to community severance will not be considered within the ES; and
- During operation, the additional direct, indirect and induced employment opportunities associated with the Proposed Development are considered to be minimal. As such, effects in relation to employment during operation will not be considered further within the ES.

Likely Significant Effects

11.2.1 The likely significant environmental effects of the construction stage which will be considered in the EIA are as follows:

- Generation of direct, indirect and induced employment opportunities during the construction stage;
- Changes in local service demands (education and healthcare), accommodation and community facilities due to an increase in population from construction workers;
- Changes in community severance and accessibility to private and community resources;
- Disruption and changes in amenity value for users of recreational / open space.

11.2.2 The likely significant environmental effects of the operational stage which will be considered in the EIA are as follows:

- Disruption and changes in amenity value for users of recreational / open space, PRowS and non-designated public routes.

11.3 Assessment Methodology

Generation of direct , indirect and induced employment opportunities during the construction stage

- 11.3.1 All analysis and assessment will use secondary data from NOMIS, which is publicly available via the Office of National Statistics (ONS). The assessment of direct, indirect and induced employment opportunities during the construction stage will be qualitative. Further information on the economy and employment will be identified through a desktop study of key sources, including relevant reports from the local authorities and Hampshire County Council.
- 11.3.2 The estimated construction workforce per annum will be derived from the total estimated cost of the construction of the Proposed Development against the average output for construction workers per annum in the industry. The total jobs generated will be evaluated within the context of existing workforce and jobs available in the industry to determine the magnitude of change.
- 11.3.3 At this stage, it is not possible to isolate the Industry Sector where the indirect and induced jobs may be generated (i.e. where impact may occur within the local economy). Therefore, these figures will be evaluated against the total number of employees in all Industry Sectors to determine the magnitude of change.

Changes in local service demands (education and healthcare), accommodation and community facilities due to an increase in population from construction workers

- 11.3.4 It is assumed that the majority of operatives during the construction stage will be drawn from across the UK and internationally due to the specialised nature of the works. Given the potential significant increase in workers relocating to the area (albeit on a temporary basis), a qualitative assessment will be undertaken for the changes in demands on local services (education and healthcare), accommodation and community facilities associated with this influx.
- 11.3.5 This assessment will take into consideration the current capacity of local services, accommodation and community facilities and identify any predicted increase in demands upon these resources. Further information on the capacity of local services, accommodation and community facilities will be identified through a desktop study of key sources, including relevant reports from the local authorities and Hampshire County Council.

Disruption and changes in amenity value for users of recreational / open space

- 11.3.6 The assessment of disruption and changes in amenity value will be undertaken in accordance with the relevant sections of DMRB Volume 11, Section 3 including Part 8: 'Pedestrians, Cyclists, Equestrians and Community Effects' for both the construction and operation periods of the Project.
- 11.3.7 Baseline information will be identified through a desktop study of key sources, including relevant reports from the local authorities and Hampshire County Council.
- 11.3.8 Part 8 of the DMRB defines amenity value as the relative 'pleasantness' of an experience. Changes to amenity value is concerned with changes in the degree and duration of a receptor's exposure to traffic - fear/safety, noise, dirt and air quality - and the effects of the Proposed Development itself. Air quality and Noise and Vibration will be considered elsewhere within the ES and will therefore not be

assessed as part of the Socio-economics ES chapter. The Socio-economics assessment will focus on changes to fear / perception of safety, journey delay and visual intrusion associated with the Proposed Development.

11.3.9 The factors which will also be taken into account include:

- Distance between the receptor and construction activity associated with the Proposed Development;
- The presence of any barriers between users of the community resources and plant and traffic associated with the construction activities of the Proposed Development; and
- Likely increase in times for accessing the resources.

11.3.10 The qualitative assessment of disruption and change in amenity value for users of community open space will consider all resources within 500m of the Proposed Development.

12 Water Resources and Flood Risk

This chapter addresses water resources and flood risk issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

12.1 Baseline Conditions

- 12.1.1 The study area will encompass surface water and groundwater features up to a minimum of 0.5km from the Proposed Development.
- 12.1.2 Information to inform the baseline conditions has been obtained through a review of:
- Ordnance Survey (OS) mapping;
 - Online MAGIC mapping;
 - Environment Agency's flood map for planning, surface water, groundwater and water abstractions;
 - British Geological Survey (BGS) online mapping; and
 - The Groundwater Management Plan (GWMP) for Hampshire (dated October 2003).
- 12.1.3 The assessment will be undertaken following the principles of the DMRB Volume 11, Section 3, Part 10 (HD 45/09) and the TAG Unit A3 Environmental Impact Appraisal – Impacts on the Water Environment as those provide a good basis for assessing effects of developments on the water environment.

Proposed Converter Station

Surface Water Features

- 12.1.4 Review of OS mapping indicates that there are no surface water features located within 0.5km of the proposed converter station. The nearest surface water feature is a pond located approximately 1.2km to the south east of the proposed converter station.
- 12.1.5 Review of the Environment Agency's water abstractions map indicates that there are no surface water abstraction licences located within the study area.

Groundwater Features

- 12.1.6 Review of the BGS mapping indicates that the proposed converter station is underlain by bedrock geology of the Tarrant Chalk Member comprising chalk.
- 12.1.7 Review of the Environment Agency's groundwater map indicates that the bedrock geology is classified as Principal Aquifer, described as layers of rock or drift deposits that have a high intergranular and/or fracture permeability. As a result, they usually provide a high level of water storage and may support water supply and/or river base flow on a strategic scale.
- 12.1.8 Review of BGS mapping indicates that superficial deposits located within the study area are clay, silt, sand and gravel.
- 12.1.9 Review of the Environment Agency's groundwater map indicates that the proposed converter station is located within an Inner Zone (Zone 1) groundwater Source Protection Zone (SPZ). Inner Zone (Zone 1) is defined as the 50 day travel time from any point below the water table to the source; this zone has a minimum radius of 50m. SPZs are typically used to protect abstractions for public water supply. Certain land uses will be restricted in order to protect groundwater quality within the area.

- 12.1.10 Review of the Environment Agency's water abstractions map indicates that there is one groundwater abstraction licence, located approximately 550m to the east of the proposed converter station. The licence is for public water supply for Portsmouth Water Ltd with a maximum daily abstraction above 2,500m³.
- 12.1.11 Review of BGS online data suggests that historic groundwater levels within the Tarrant Chalk Member are at significant depth. It is unknown at this stage the degree to which local groundwater levels could be suppressed as a result of the cumulative drawdown impacts of groundwater abstraction supply wells that are in operation and define the source protection zones. The potential for groundwater level rebound if the supply wells were to cease operation is unknown at this stage.
- 12.1.12 In addition, a review of BGS online borehole records in the vicinity of the converter sites describes the Tarrant Chalk Member as soft white chalk with relatively widely spaced but large flint seams. There is a potential therefore that weathered chalk may be present in the form of what is often described as putty chalk within the excavation depth for the converter station.

Flooding

- 12.1.13 Review of the Environment Agency's Flood Map for Planning (Rivers and Sea) indicates that the proposed converter station is located in the low risk Flood Zone 1, where the risk of flooding from fluvial sources is less than 1 in 1000 (0.1%) in any year.
- 12.1.14 Review of the Environment Agency's Flood Risk from Surface Water map indicates that the proposed converter station site is at a very low risk of flooding from surface water sources. The map identifies a natural overland flow path which flows along the western edge of the existing substation, and in a south-western direction through Stoneacre Copse and onwards towards Denmead Farm. This is likely to be due to a local depression in topography where surface water can accumulate during or following heavy rainfall events.
- 12.1.15 The Groundwater Management Plan (GWMP) for Hampshire (Hampshire County Council, 2003) identifies areas that are susceptible to groundwater flood emergence. The map provided in the report indicates that the proposed converter station site are at a very low risk.
- 12.1.16 The Lead Local Flood Authority (LLFA), in this case Hampshire County Council, and the Environment Agency will be consulted during the EIA process to identify any historic flood events within the study area.

Cable Route and Landfall

- 12.1.17 For the purpose of this assessment the cable route has been divided into a northern section (Horndean to Purbrook) and a southern section (Farlington to the southern end of Portsea Island).

Surface Water Features

Northern Section

- 12.1.18 Review of OS mapping indicates that the cable route cross or are located within 0.5km of approximately four watercourses or land drains (focusing on the larger watercourses), and eight ponds in the northern section of the study area. This will be further refined in the EIA following consultation with the Environment Agency and LLFA.

- 12.1.19 Four of the watercourses identified within 0.5km of the proposed cable route are classified as main river and therefore under the jurisdiction of the Environment Agency. All of the other watercourses are classified as ordinary watercourses under the jurisdiction of Hampshire County Council as LLFA. All of the surface water the features have no known designations, and the use quality and ecological value of these features is currently unclear. This will be further assessed in the ES.
- 12.1.20 Ecological and chemical quality of a number of the watercourses and tributaries within the study area is assessed by the Environment Agency in accordance with Water Framework Directive (WFD) objectives. The watercourses located near to Purbrook, Waterlooville and Lovedean are located within the Powell Trib catchment area. These watercourses have an overall score of 'Moderate', with a 'Moderate' ecological status and 'Good' chemical status.
- 12.1.21 Review of the Environment Agency's water abstractions map indicates that there is one medium sized abstraction licence from tidal water sources located within the study area. The licence is used for industrial, commercial and public services.

Southern Section

- 12.1.22 Review of OS mapping indicates that the proposed cable route cross or are located within 0.5km of approximately six watercourses or land drains (this stage of assessment has focused on the larger watercourses), and nine ponds in the southern section of the study area. This will be further refined in the ES following consultation with the Environment Agency and LLFA.
- 12.1.23 Two of the watercourses identified within 0.5km of the proposed cable route are classified as main river and therefore under the jurisdiction of the EA. All of the other watercourses are classified as ordinary watercourses under the jurisdiction of Hampshire County Council as LLFA. With the exception of the Broom Channel which discharges into the Langstone Channel, the features have no known designations, and the use quality and ecological value of these features is currently unclear. This will be further assessed in the ES.
- 12.1.24 Ecological and chemical quality of the Broom Channel, located to the south of Farlington Marshes, is assessed by the Environment Agency in accordance with WFD objectives. The Broom Channel is located within the Langstone Harbour catchment area. The overall status of the waterbody is 'Moderate', with a 'Moderate' ecological status and 'Good' chemical status.
- 12.1.25 The Broom Channel forms part of the Chichester and Langstone Harbours Ramsar Site, Langstone Harbour SSSI, Solent Maritime SAC and Chichester and Langstone Harbours SPA. The Langstone Harbour SSSI has been divided into 14 units by Natural England. Unit 3 'Langstone Harbour West' is located within the study area. Natural England undertook an assessment of this area in 2010, which determined this unit to be 'Unfavourable – Recovering'.

Entire Cable Route

- 12.1.26 All watercourses in the study area of the cable route drain to either the Langstone Harbour or the Portsmouth Harbour areas. The watercourses are part of the South East River Basin District.
- 12.1.27 Review of the Environment Agency's water abstractions map indicates that there are no surface water abstractions licences located within the study area.

Groundwater Features

Northern Section

- 12.1.28 Review of the BGS mapping indicates that the cable route is underlain by the following bedrock geology in the northern section of the study area, in horizontal seams from approximately north to south:
- Tarrant Chalk Member comprising chalk;
 - Lambeth Group comprising clay, silt and sand;
 - London Clay Formation comprising clay, silt and sand;
 - Bognor Sand Member comprising sand;
 - Wittering Formation comprising sand;
 - Wittering Formation comprising sand, silt and clay; and
 - Portsdown Chalk Formation comprising chalk.
- 12.1.29 Review of the Environment Agency's groundwater map indicates that the bedrock geology in the northern section of the cable route, located close to the proposed converter station and to the areas surrounding Farlington, Drayton and Anchorage Park, are classified as Principal Aquifer, described as layers of rock or drift deposits that have a high intergranular and/or fracture permeability. As a result, they usually provide a high level of water storage and may support water supply and/or river base flow on a strategic scale.
- 12.1.30 Review of BGS mapping indicates that superficial deposits within the study area are mostly clay, silt, sand and gravel in the northern section of the cable route.
- 12.1.31 Review of the Environment Agency's groundwater map indicates that the northern section of the proposed cable route is located within an Inner Zone (Zone 1) groundwater SPZ. Inner Zone (Zone 1) is defined in the proposed converter station site section above. The area below the Inner Zone (Zone 1), extending south to Purbrook, is located within an Inner Zone – Subsurface activity only SPZ. Inner Zone – Subsurface activity only extends the Zone 1 where the aquifer is confined and may be impacted by deep drilling activities.
- 12.1.32 The Environment Agency's groundwater map also indicates that the area immediately south of the Inner Zone (Zone 1) SPZ is located within an Outer Zone (Zone 2) SPZ. Outer Zone (Zone 2) is defined by a 400 day travel time from a point below the water table. This zone has a minimum radius of 250 or 500 metres around the source, depending on the size of the abstraction. Further consultation with the EA will be undertaken as part of the EIA.
- 12.1.33 Review of the Environment Agency's water abstractions map indicates that there is one groundwater abstraction licence located within the study area.

Southern Section

- 12.1.34 Review of the BGS mapping indicates that the cable route is underlain by the following bedrock geology in the southern section of the study area, in horizontal seams from approximately north to south:
- Spetisbury Chalk Member comprising chalk;
 - Newhaven Chalk Formation comprising chalk;
 - Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culvert Chalk Formation and Portsdown Chalk Formation (undifferentiated) comprising chalk;

- Lambeth Group comprising clay, silt and sand;
- London Clay Formation comprising clay, silt and sand;
- Bognor Sand Member comprising sand;
- Portsmouth Sand Member and Whitecliff Sand Member (Undifferentiated) comprising sand; and
- Wittering Formation comprising sand, silt and clay.

12.1.35 Review of BGS mapping indicates that to the south of the cable route the majority of superficial deposits are river terrace deposits consisting of sand, silt and clay. There are also areas of raised marine deposits consisting of sand and gravel and areas of tidal flat deposits consisting of clay, silt, sand and gravel.

12.1.36 Review of the Environment Agency's groundwater map indicates that the majority of the superficial deposits in the southern section of the study area are classified as Secondary A Aquifer. A section of the southern area is, and areas in the northern part of the study area are classified as Secondary (Undifferentiated) Aquifer.

Entire Cable Route

12.1.37 Review of the Environment Agency's groundwater map indicates that bedrock geology in areas located throughout the study area is classified as Secondary A Aquifer, described as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Flooding

Northern Section

12.1.38 Review of the Environment Agency's Flood Map for Planning (Rivers and Sea) indicates that the majority of the northern section of the cable route is located in the low risk Flood Zone 1, where the risk of flooding from fluvial sources is less than 1 in 1000 (0.1%) in any year. However, there are also sections located in the medium risk Flood Zone 2, where the risk of flooding from fluvial flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%) in any year, and the high risk Flood Zone 3, where there is a greater than a 1 in 100 (1%) risk of fluvial flooding in any year. The identified fluvial flood risk is associated with the upper reaches and tributaries of the Wallington River.

12.1.39 The GWMP for Hampshire (Hampshire County Council, 2003) identifies areas that are susceptible to groundwater flood emergence. The map provided in the report indicates that areas of the northern section of the cable route have up to a 50% susceptibility to groundwater flood emergence.

Southern Section

12.1.40 The Environment Agency's Flood Map for Planning (Rivers and Sea) indicates that the majority of the southern section of the cable route near to Anchorage Park, Farlington and the eastern side of Portsea Island is located in the high risk Flood Zone 3, with some areas located in the medium risk Flood Zone 2. Current assessment indicates that flooding is tidally dominated, however that may also be a fluvial flood risk contribution, this will be determined as part of the EIA.

12.1.41 The GWMP for Hampshire (Hampshire County Council, 2003) identified the southern section of the proposed cable route is at a very low risk of susceptibility to groundwater flood emergence.

Entire Cable Route

- 12.1.42 Review of the Environment Agency's Flood Risk from Surface Water map indicates that sections of the cable route are at risk of flooding from surface water sources. In addition to overland flow routes, the Flood Risk from Surface Water map also indicates fluvial flood risk from watercourses with a catchment of less than c. 3km² that are too small to be mapped on the Environment Agency's Flood Map for Planning.
- 12.1.43 LLFA, in this case Hampshire County Council, and the Environment Agency will be consulted during the EIA to identify any historic flood events within the study area.

12.2 Scope of Assessment

- 12.2.1 The aspects of the water environment that will be considered within this section include the ecological, chemical and hydromorphological quality of surface water features, flood risk, unsaturated zone and groundwater flow characteristics and groundwater quality in so far that groundwater may be affected by surface-borne pollutants.
- 12.2.2 Potential impacts to groundwater associated with impacts to groundwater quantity, groundwater flows and the release of contaminants contained in the ground will be assessed in the Ground Conditions chapter. Similarly, impacts on sensitive and/or important aquatic species and habitats, will be assessed in the Ecology chapter.
- 12.2.3 The study area will encompass surface water features up to a minimum of 0.5km from the Proposed Development. This distance is considered appropriate for the assessment of direct effects (i.e. associated with overland migration of pollutants directly to a surface features, pollutants conveyed in drainage systems, and works within the river channel). Features that are in hydraulic connectivity with the study area will also be considered, including surface water abstractions and downstream watercourses. Based on the professional judgement of the assessor and current knowledge of the area, features located up to a distance of approximately 1km from the Proposed Development will be considered. This distance is considered appropriate for the assessment of indirect effects, although if sensitive features located further than 1km from the Proposed Development are identified to be at risk, these features will also be considered within the assessment.
- 12.2.4 The study area will encompass groundwater features within approximately 0.5km of the Proposed Development and groundwater abstractions up to a minimum of 1km from the Proposed Development. This distance is considered appropriate for the assessment of surface-borne pollutants migrating to groundwater features.

12.3 Assessment Methodology

- 12.3.1 The assessment will be undertaken following the principles of the DMRB Volume 11, Section 3, Part 10 (HD 45/09) and the TAG Unit A3 Environmental Impact Appraisal – Impacts on the Water Environment as those provide a good basis for assessing effects of schemes and developments on the water environment. The DMRB promotes the following approach:
- Estimation of the importance of the attribute;
 - Estimation of the magnitude of the impacts; and
 - Assessment of the significance of the impact based on the importance of the attribute and magnitude of the impact.

12.3.2 In summary, our proposed methodology is as follows:

- Review of international, national and local legislation, policies and guidelines in relation to water resources, water quality and flood risk. This shall include a review of the requirements of the WFD;
- Establish baseline conditions within the study area through review of desk based sources of information, literature review, site walkover and consultation with relevant authorities;
- Assessment of potential effects, development of mitigation and assessment of residual effects;
- Assessment of any impact to flood defences, most likely from within the tidal area (landfall);
- Consultation with the Environment Agency regarding identified flood risks and the potential effects to the main rivers associated with the cable route and landfall;
- Consultation with Hampshire County Council regarding the potential effects to ordinary watercourses and the proposed management of surface water runoff; and
- Identify any opportunities for enhancement of water quality and water management.

12.3.3 In accordance with the principles of the DMRB, the assessment will consider the potential effects of surface water runoff and groundwater features, and impacts to flooding. In addition to the core aspects promoted within DMRB, the assessment of impacts to the water environment will also consider potential impacts to the hydromorphological quality of surface water features. This is likely to be associated with the timing and seasonality of the works. It is proposed that this assessment is qualitative and informed by desk based study, site walkover and consultation with the Ecology team. Consultation with the Environment Agency and LLFA will determine the most appropriate method associated with watercourse crossings.

12.3.4 A standalone Flood Risk Assessment (FRA) will be undertaken in accordance with NPPF to assess the potential implications of the Proposed Development on flood risk to people and property elsewhere, as well as assess the potential risk of flooding to the Proposed Development. It is proposed that the following aspects will be considered:

- Potential impacts to flood flow conveyance in watercourses crossed by the scheme for both temporary diversions and permanent amendments to water features;
- Potential impacts to the scheme from all sources of flooding, including fluvial, tidal, surface water, groundwater, drainage systems and artificial sources;
- Potential impacts of the scheme to people and property elsewhere; and
- Potential impacts to surface water flooding associated with a loss of permeable area within the proposed converter station site associated with the proposed surface water drainage system.

12.3.5 The FRA will consider the potential impact of climate change in accordance with current policy; expected increases in river flows, sea levels and rainfall will therefore be taken into account e.g. sea level rise for the East of England of 1.21m to 2115 and an increase in rainfall intensity of 20% to 40%.

12.3.6 It is considered unlikely that hydraulic modelling, to inform the assessment of flood risk to the Proposed Development or elsewhere as a result of the scheme, will be required given the nature of the Proposed Development.

12.3.7 It is not proposed to undertake water quality sampling to inform the assessment of the impacts of the scheme on the quality of the water features nearby.

13 Ground Conditions

This chapter addresses ground conditions in relation to the entire Proposed Development, so is relevant to all the LPAs.

13.1 Baseline Conditions

- 13.1.1 The method for determining the baseline conditions will involve a review of publically and commercially available data from Envirocheck Reports, the Environment Agency, the British Geological Survey (BGS), Historic England, Natural England, and The Coal Authority.
- 13.1.2 The 'study area' will comprise the maximum physical extent of the route option plus a buffer zone of 250m. This distance is referenced in best practice documents and is considered typical at the hazard identification stage of site assessment. This Scoping Report refers to the cable route, proposed converter station and the landfall site as the 'study area'. Specific differences between the proposed converter station location options are noted where applicable.

Proposed Converter Station Site

Ground conditions

Made Ground

- 13.1.3 BGS mapping indicates no areas of Made Ground in the study area for the proposed converter station, though it would be anticipated that areas of Made Ground could be present around the Lovedean substation, existing highways and disused pits.

Superficial Deposits

- 13.1.4 BGS 1:50,000 mapping indicates bedrock to be close to or at surface with some localised Head Deposits.

Bedrock

- 13.1.5 The study areas are within the 'Hampshire Basin' geological region.
- 13.1.6 The 1:50,000 scale mapping published by BGS indicates that the study area is underlain by White Chalk Subgroup (Tarrant Chalk Member).

Groundwater

- 13.1.7 The study area is underlain by a Principal Aquifer as designated by the Environment Agency and located within a Zone 1 Source Protection Zone for groundwater protection.
- 13.1.8 Historical chalk groundwater level data from the local area around the proposed converter stations sites appear to be at significant depth below ground level. This may be because groundwater levels may be suppressed as a result of the cumulative drawdown effects of groundwater abstractions that define the local source protection zones.

Surface water

- 13.1.9 No surface water features are located within the study area.

Cable Route and Landfall

Ground Conditions

Made Ground

- 13.1.10 BGS mapping indicates a number of areas of Made Ground within the study area associated with infilled land with unknown fill, historical landfills accepting a variety of commercial and household waste.
- 13.1.11 There is the potential for Made Ground and worked ground to be present associated with all current and historical developments and the existing highway network including embankments and cuttings.

Superficial Deposits

- 13.1.12 BGS 1:50,000 scale mapping indicates superficial deposits to be present across the study area of the route predominantly in the southern half of the route. These include a mixture of Raised Marine Deposits, Beach and Tidal Flat Deposits, Storm Beach Deposits, River Terrace Deposits and Head Deposits and along the route.

Bedrock

- 13.1.13 BGS 1:50,000 scale mapping indicates that the study area is primarily underlain by a mixture of Bracklesham Group and Barton Group (Wittering Formation and Earnley Formation), Thames Group (London Clay, Bognor Sand Member, Portsmouth Sand Member and Whitecliff Sand Member), Lambeth Group and White Chalk Subgroup (Portsmouth Chalk, Culver Chalk, Newhaven Chalk and Lewes Nodular Chalk).

Groundwater

- 13.1.14 The proposed route is directly underlain by Principal Aquifers, Secondary A Aquifers and unproductive soils/rocks as designated by the Environment Agency. The Principal Aquifer is generally found in the middle of the route and the very northern section although this is likely to underlie the Secondary A Aquifers. The northern area of the route is located within Source Protection Zones I and II for groundwater source protection relating to Lovedean pumping station Potable Water Supply.
- 13.1.15 Superficial deposits along the proposed route are classified as Secondary A Aquifers or Secondary (Undifferentiated) Aquifers.

Surface Water

- 13.1.16 The cable route crosses a number of 'main rivers' as well as a number of unnamed surface water receptors.
- 13.1.17 'Main rivers' are usually larger rivers and streams for which the Environment Agency has powers to carry out maintenance, improvement or construction work to manage flood risk.

Designated Sites

- 13.1.18 The route does not traverse any designated site of geological importance.

Potential Sources of Contamination

- 13.1.19 From a review of available data a number of potential contamination sources have been noted within the study area of the route and the proposed converter station

location options. Across the study areas there is a mixture of urban (residential, commercial and industrial) and agricultural land. The potential sources of contamination which have been noted include current and historical landfills, infilled pits with unknown fill, active fuel filling stations, electrical substations, and a number of industrial areas. A detailed review of potential sources of contamination will be completed in the preliminary risk assessment.

13.2 Scope of Assessment

13.2.1 The Ground Conditions assessment will cover the environmental topic areas of land contamination, mineral resources and sites of geological interest.

13.2.2 In this context, “land contamination” includes both soil and water contamination, i.e. releases to ground and surface water bodies. Wider issues of groundwater and surface water resources are contained within Section 12 (Water Resources and Flood Risk) of this Scoping Report.

13.2.3 The land quality section will interact with a number of the other ES sections including:

- Ecology (Section 10);
- Soils and Land Use (Section 16);
- Carbon and Climate Change (related to waste) (Section 14); and
- Water Resources and Flood Risk (Section 12).

Land Contamination

13.2.4 Land and groundwater may have become contaminated through previous industrial or agricultural practices. Such land or groundwater could adversely affect people and the wider environment; including effects on groundwater quality, surface water quality and ecology.

13.2.5 The ES will assess the likelihood of existing contamination being encountered during the construction process, such that it could cause significant environmental harm or adverse health effects if not addressed adequately at the construction and/or operational stages.

13.2.6 There is an identified potential for contaminant linkages to exist within the study area relating to potentially contaminative current and historical land use and sensitive human health, controlled waters and built environment receptors. It is therefore recommended that a desk-based assessment is undertaken in accordance with Model Procedures for the Management of Land Contamination: Contaminated Land Report 11 (Defra and the Environment Agency). The assessment should include a Preliminary Risk Assessment (PRA) and development of a preliminary conceptual site model and should seek to identify potentially significant effects and constraints relating to soil, geology, construction waste and land contamination.

13.2.7 Further assessment involving an intrusive ground investigation may be required if, after the completion of a PRA, a low confidence or high uncertainty remains with respect to the likelihood or significance of effects or constraints.

Waste and Material Resources

13.2.8 Remediation of contamination can lead to a requirement for treatment and/or disposal of contaminated materials. Issues of onsite treatment and re-use of contaminated materials will be dealt with in the land quality assessment along with issues related to the disposal of contaminated soils off site.

Geological and Mineral Features

13.2.9 Along the cable route of the Proposed Development there may also be areas of land that have special geological significance, either from a scientific, or mineral resources point of view, such as:

- Geological SSSI;
- Local Geological Sites (LGS);
- Regionally Important Geological Sites (RIGS); and
- Currently permitted and proposed future mineral and resource extraction areas, which may be compromised or sterilised by the construction and operation of the proposed scheme.

Other Potential Issues

13.2.10 The proposed excavation invert depth for housing the converter station may be founded within putty chalk which would likely be of a low permeability. The proposed excavation (~200m x 200m) is expected to remain open for construction works for up to two years. The potential therefore exists that during the wetter period of the year, which is generally considered to be the winter months, sustained periods of rainfall and increased stormwater runoff will occur that could inundate the converter station excavation. The potential for this 'what-if scenario' will be considered as part of general engineering risk appreciation, buildability and environmental impact considerations. In broad terms the potential construction risks are:

- The excavation 'fills' or partially fills with water which would provide a challenge as to how to reduce the head of water within the excavation e.g. pumping out the water and the potential avenues for treating and discharging the water, which could be limited; and
- The resulting saturated putty chalk could be a challenge with respect to the design and construction of the platform formation level.

13.2.11 The potential operational risks of the converter station include the possibility that groundwater levels from the chalk beneath the converter station rebound in future years. This could for example have an effect on the skin friction of the piles used as load-bearing structures for the converter platform but will be considered as part of the 'what-if' engineering scenarios.

13.3 Assessment Methodology

13.3.1 A PRA will be undertaken to establish baseline conditions within the study area. This will comprise a desk-based review of all relevant information including historical mapping, any available ground investigation reports and a walkover survey to inspect the study area and obtain recent photography.

13.3.2 The information from the PRA will be used to assess the impacts associated with contaminated land by developing a conceptual site model (CSM). The CSM will assess contamination linkages by determining all possible source, pathways and receptor within the study area.

13.3.3 The semi quantitative assessment within this topic area considers land quality from the perspective of land contamination. It excludes soils quality from an agricultural or forestry perspective. Such an assessment will be found in Chapter 16 (Soils and Land Use) of this Scoping Report. Land contamination has the potential to affect

groundwater resources. Wider issues of groundwater and surface water resources are contained within Section 12 (Water and Flood Risk) of this Scoping Report. Land contamination has the potential to affect ecological resources¹⁸. Other ecological issues are addressed in Section 10 **Error! Reference source not found.** of this coping Report.

Significance criteria

13.3.4 The likelihood must be demonstrated that there is an identifiable source of contamination (be it an onsite or offsite source), sensitive receptors and a viable pathway through which the former may affect the latter.

13.3.5 The sensitivity of potential receptors can be described qualitatively according to the categories shown in **Table 13.1**.

Table 13.1: Criteria for assessing receptor sensitivity¹⁹

RECEPTOR SENSITIVITY/ VALUE OF RESOURCE	RECEPTOR/ RESOURCE ²⁰
High	Residential areas, schools and playing fields Surface water bodies of high quality and/or Principal aquifers Nationally designated areas e.g. SSSI Major strategic mineral resource areas Strategic underground storage space
Moderate	Retail and business parks (public and work places) Allotments and market gardens Surface water bodies of moderate quality, and/or Secondary A Aquifers Regionally designated areas e.g. local nature reserves or LGS Regionally or locally important mineral resource areas (MPA or MSA)
Low	Commercial or industrial development Mineral Areas of Search/ Consultation Areas (MCA) Secondary B and undifferentiated aquifers

13.3.6 Construction and/or maintenance workers are not included in the list of receptors, as it will be a fundamental requirement that any construction/maintenance workers on the Proposed Development are adequately protected from the effects of any contamination via project specific health and safety plans and procedures which will be put in place prior to the construction stage.

13.3.7 The magnitude of the effects of contaminated land is assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction and at post construction stages. This provides a way of assessing both the adverse and beneficial effects during construction and the post construction period.

¹⁸ DEFRA (2012). *Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (Section 4.3)*. Her Majesty's Stationery Office, London

¹⁹ Based on the Highways Agency (2008), Design Manual for Roads and Bridges (DMRB), Volume 11 Environmental Assessment, Section 2 Environmental Impact Assessment, Part 5 Assessment and Management of Environmental Effects, The Stationery Office

²⁰ Resource applies to both minerals and geological sites and is defined as a "mineral body including aggregates, salt, coal and other hydrocarbons and a site of local geological interest"

- 13.3.8 The magnitude of potential proposed scheme impacts regarding land quality issues will be assessed using a four-point scale as shown in **Table 13.2**.

Table 13.2: Impact magnitude criteria²¹

IMPACT MAGNITUDE	CRITERIA	EXAMPLES
High	Results in loss of attribute and/or likely to cause exceedance of statutory objectives and/or breach of legislation	Likely significant human health impact ²² , contamination of a Principal aquifer, or loss or isolation of strategic mineral resource
Moderate	Results in impact on integrity of attribute/or loss of part of attribute, and/or possibly cause exceedance of statutory objectives and/or breach of legislation	Reduction in the value of a feature, moderate human health impact, loss or isolation of regional/local mineral resource
Low	Results in minor impacts on attribute	Measurable change in attribute, but of limited size/proportion
Negligible	Results in no change or impact on attribute	No significant loss in quality of feature/attribute

- 13.3.9 The assessment of significance is based on the magnitude of the impact and the importance or sensitivity of the receptors. Appropriate mitigation measures will be recommended in order to reduce/control any significant adverse effects on sensitive receptors.

13.3.10 Effects have the potential to be adverse, beneficial or neutral.

13.3.11 The significance of the effect will be affected by:

- The value of the resource;
- The sensitivity of the receptor;
- The strength and length of the pathway; and
- The size of the area affected.

13.3.12 Adverse and beneficial effects are further classified as being minor, moderate or major in significance, with only moderate or major significant effects being reported.

13.3.13 **Table 13.3** summarises the criteria for assessing effect significance.

Table 13.3: Significance of effects criteria²³

SIGNIFICANCE	DESCRIPTION
Major adverse	Considerable detrimental effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability/legislation/policy standards
Moderate adverse	Limited detrimental effect (by extent, duration or magnitude) that may be considered significant
Minor adverse	Slight, very short or highly localised detrimental effect
Neutral	No appreciable effect

²¹ Based on the Highways Agency (2008), Design Manual for Roads and Bridges (DMRB), Volume 11 Environmental Assessment, Section 2 Environmental Impact Assessment, Part 5 Assessment and Management of Environmental Effects, The Stationery Office

²² Defined in Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012) Section 4.1

SIGNIFICANCE	DESCRIPTION
Minor beneficial	Minor reduction in risk (slight, short or highly localised effect)
Moderate beneficial	Moderate reduction in risk
Major beneficial	Major reduction in risk

Construction effects

13.3.14 The impact of existing land contamination will predominantly occur during the construction stage. A fundamental requirement of the Proposed Development will be to carry out sufficient mitigation or remediation of contamination such that, following construction, there are no continuing significant adverse effects from the contamination during the operational stage of the Proposed Development.

Operational effects

13.3.15 The major operational sources of contamination will be reviewed and appropriate mitigation measures proposed.

14 Carbon and Climate Change

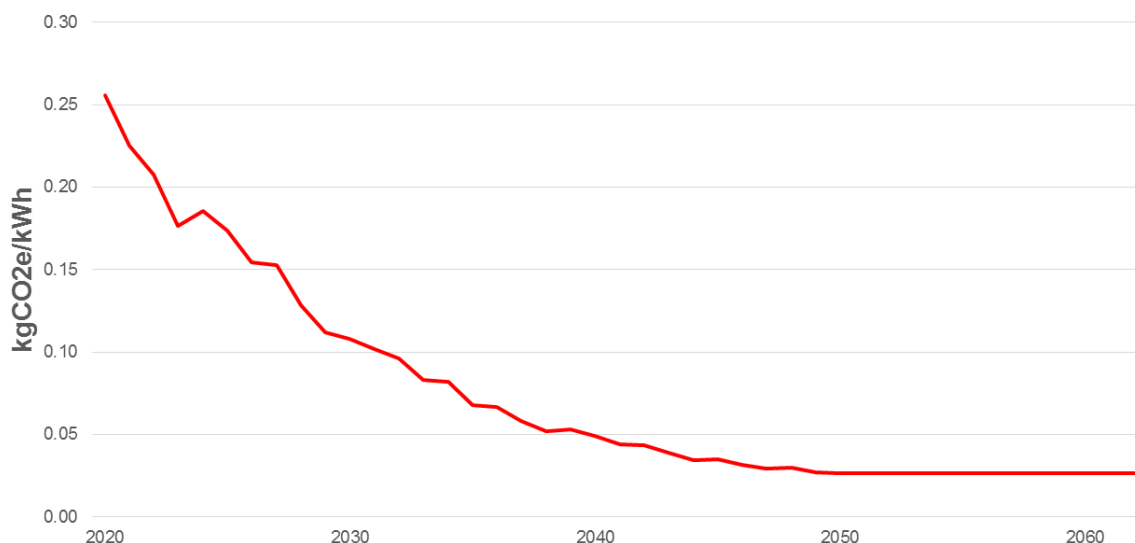
This chapter addresses carbon and climate change issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

14.1 Baseline conditions

14.1.1 The following baseline conditions are applicable to both the proposed converter station and cable route.

GHG emissions assessment

- 14.1.2 The greenhouse gas (GHG) assessment includes any increase or decrease in emissions as a result of the Proposed Development but there is no geographical restriction in terms of where those emissions occur. For example, construction emissions occur in the area of the Proposed Development footprint but are also related to the transport of materials to and from the site, their manufacturing and disposal. Operational emissions include those from the generation of electricity which is consumed or lost from the Proposed Development infrastructure, and emissions and energy consumption associated with maintenance activities.
- 14.1.3 In the current and future baseline scenario (without the Proposed Development), GHG emissions occur constantly and widely as a result of human and natural activity including energy consumption (fuel, power), industrial processes, land use and land use change in the area of the Proposed Development and beyond. The GHG assessment for the Proposed Development will only consider where it results in additional or avoided emissions in comparison to the baseline scenario.
- 14.1.4 The Proposed Development will provide for the transfer of electricity between France and the UK, according to the relative supply/demand in the respective countries. The current (2017) GHG emissions intensity of grid electricity in the UK (predominantly generated from fossil-fuel sources) is approximately 0.3kgCO_{2e} per kWh. However, as UK electricity generation is decarbonised, the intensity is projected to continue decreasing over the lifetime of the Project (2022-2062) stabilising around 0.03 kgCO_{2e} per kWh, as shown in **Inset 14.1**.



Inset 14.1: GHG emissions intensity of UK grid average electricity (BEIS²⁴)

- 14.1.5 In France, the GHG emissions intensity of grid electricity is much lower as a result of the high proportion of nuclear and renewable power generation. In 2013, the emissions intensity was approximately 0.06 kgCO₂e per kWh with future projections for the year 2030 of between 0.02 and 0.06 kgCO₂e per kWh (RTE, 201425).
- 14.1.6 Electricity transferred from France is therefore projected to be of much lower emissions intensity than the UK until at least 2037, but this is likely to continue throughout the lifespan of the Proposed Development.

Climate resilience assessment

- 14.1.7 The study area for the climate resilience assessment comprises the footprint of the Proposed Development.
- 14.1.8 The baseline for the climate resilience assessment comprises the recent historical climate conditions (1961 to 1990) as well as the future projections for key climate parameters. All figures are taken from the UKCP0926 projections which cover the whole of the UK. Future projections are provided for the 2020s (2010-2039; corresponding to the construction period) as well as the 2040s (2030-2059) and 2060s (2050-2079) during the Proposed Development's operational design life.
- 14.1.9 UKCP09 has been used to identify climate projections using the high emissions scenario and the central estimate (50% probability), in common with other major infrastructure developers and operators.
- 14.1.10 **Tables 14.1 and 14.2** show the absolute and projected changes in temperatures over the Proposed Development's design life (40 years). For all time periods, temperatures during both winter and summer are expected to increase. The warmest

²⁴ Department for Business, Energy and Industrial Strategy (2017) *Valuation of energy use and greenhouse gas emissions for appraisal, Supplementary guidance to the HM Treasury Green Book on Appraisal and Evaluation in Central Government*

²⁵ Réseau de transport d'électricité (2014) Bilan prévisionnel de l'équilibre offre -demande d'électricité en France (Edition 2014) Accessed September 2017 at: http://www.rte-france.com/sites/default/files/bilan_complet_2014.pdf

²⁶ UK Climate Projections (2009) is the leading source of climate information for the UK and its regions, based on Met Office data. Accessed September 2017 at: <http://ukclimateprojections.metoffice.gov.uk/>

day in summer is projected to increase by almost 1.3°C between 2010 – 2039, and by 2.5°C towards the Proposed Development's end of life.

14.1.11 All the environmental assessment topics for this Proposed Development will take into account the potential for in-combination impacts and effects in relation to these climate change projections.

Table 14.2: Absolute temperature

PERIOD	SUMMER - MEAN DAILY TEMPERATURE (°C)	WINTER - MEAN DAILY TEMPERATURE (°C)	SUMMER - MEAN DAILY MAXIMUM TEMPERATURE (°C)	WINTER - MEAN DAILY MINIMUM TEMPERATURE (°C)
2010 - 2039	17.5 °C	6.0 °C	22.3 °C	3.3 °C
2030 - 2059	18.3 °C	6.5 °C	23.3 °C	3.9 °C
2050 - 2079	19.1 °C	7.2 °C	24.4 °C	4.6 °C

Table 14.3: Projected change in temperature

PERIOD	SUMMER - MEAN DAILY TEMPERATURE (°C)	WINTER - MEAN DAILY TEMPERATURE (°C)	SUMMER - MEAN DAILY MAXIMUM TEMPERATURE (°C)	WINTER - MEAN DAILY MINIMUM TEMPERATURE (°C)	SUMMER - WARMEST DAY (°C)	SUMMER - WARMEST NIGHT (°C)
2010 - 2039	+ 1.6 °C	+ 1.4 °C	+ 2.0 °C	+ 1.5 °C	+ 1.3 °C	+ 1.2 °C
2030 - 2059	+ 2.4 °C	+ 2.0 °C	+ 3.0 °C	+ 2.1 °C	+ 2.2 °C	+ 2.1 °C
2050 - 2079	+ 3.2 °C	+ 2.6 °C	+ 4.0 °C	+ 2.8 °C	+ 2.5 °C	+ 2.7 °C

14.1.12 **Table 14.3** and **14.4** show the absolute and projected changes in precipitation over the Proposed Development's design life. During winter, precipitation is projected to increase across all time periods. This may have the potential to lead to more extreme rainfall events, as increases range from +7% up to 2039 and +19% towards the end of the century.

14.1.13 In summer, average precipitation is projected to decrease by up to 10% towards 2039, and by 28% towards the end of the century.

Table 14.4: Absolute precipitation

PERIOD	SUMMER - AVERAGE PRECIPITATION (MM/DAY)	WINTER - AVERAGE PRECIPITATION (MM/DAY)
2010 – 2039	1.5 mm/day	2.7 mm/day
2030 – 2059	1.4 mm/day	2.9 mm/day
2050 – 2079	1.2 mm/day	3.0 mm/day

Table 14.5: Projected change in precipitation

PERIOD	SUMMER - AVERAGE PRECIPITATION (%)	WINTER - AVERAGE PRECIPITATION (%)	SUMMER - WETTEST DAY (%)	WINTER - WETTEST DAY (%)
2010 – 2039	-10.4%	+ 7.3%	-0.7%	+ 8.0%
2030 – 2059	-16.4%	+ 13.2%	-5.3%	+ 13.3%
2050 – 2079	-27.5%	+ 18.6%	-10.4%	+ 17.2%

14.2 Scope of assessment

GHG assessment

14.2.1 The approach to GHG assessment is based upon IEMA's EIA guide²⁷ 'Assessing GHG emissions and evaluating their significance'.

14.2.2 **Table 14.5** provides detail of the relevant types/sources of emissions at each stage of the lifecycle of the Proposed Development and a decision on whether this stage will be scoped in or out for environmental assessment. This decision is taken on the basis of the likely magnitude of GHG emissions (or avoided emissions) in comparison to the baseline scenario with no Proposed Development.

Table 14.6: Proposed scope of the GHG assessment

	LIFECYCLE STAGE AND EMISSIONS ACTIVITY	REASONING	SCOPE IN/OUT
Construction	Product stage; including raw material supply, transport and manufacture	Emissions 'embodied in' construction materials typically form the greatest proportion of a Proposed Development's construction emissions. The Proposed Development will involve large quantities of steel and concrete for the proposed converter station structure and infrastructure, as well as metal in the terrestrial cable itself.	In
	Construction process stage; including transport to/from works site and construction/installation processes.	Emissions from the construction process can be considerable especially in schemes involving large quantities of earth excavation, on-site movement and removal of arising. There is the potential for large amounts of earth movement for the proposed converter station and cable trenching.	In
	Land use, land use change and forestry (LULUCF).	None of the proposed locations for the proposed converter station contain significant woodland vegetation. The cable route will largely be within the footprint of roads and it is assumed that any agricultural land will be re-instated.	Out
Operation	Operation and maintenance	Power will be consumed at the proposed converter station throughout its design life for operation, lighting and cooling. Insulants/cooling gasses (potent GHGs) may be used and leak from the proposed converter station. Electricity transmission losses (consumption) will occur at the proposed converter station/cables.	In

²⁷ IEMA (2017) EIA guide to Assessing GHG emissions and evaluating their significance.

	LIFECYCLE STAGE AND EMISSIONS ACTIVITY	REASONING	SCOPE IN/OUT
	Repair and refurbishment	It is anticipated that the control system and converter technology will be replaced after 15-20 years, with the remainder of the infrastructure expected to last the duration of the 40 year design life.	In
End of life	Deconstruction	Decommissioning will result in emissions from the process of deconstruction and removing the proposed converter station infrastructure and the underground terrestrial cables (if removed). In contrast, this process will result in material which may be recycled thereby offering emissions savings for the next product system. These two aspects will balance each other to an extent and, combined with the uncertainty around future decommissioning processes over 40 years into the future, it is therefore not appropriate to assess this lifecycle stage.	Out
	Transportation of waste arisings		
	Waste processing for recovery		
	Disposal		
Beyond system boundary	Emissions or avoided emissions which are a result of the Proposed Development but are not related to its construction, operation or end of life.	A net reduction in emissions may be demonstrated as a result of the transfer of electricity predominantly from France (relatively low electricity generation emissions-intensity).	In

14.2.3 Since there is only limited information regarding the magnitude of emissions activity at this stage of the assessment, a conservative approach has been taken to scoping.

Likely Significant Effects

14.2.4 The impacts of GHGs relate to their contribution to global warming and climate change. These impacts are global and cumulative in nature, with every tonne of GHGs contributing to impacts upon natural and human systems.

14.2.5 GHGs are natural and man-made gases occurring in the atmosphere which absorb and emit infrared radiation thereby maintaining the Sun’s energy within the Earth’s atmosphere. There is an overwhelming scientific consensus that the major increase in the concentration of GHGs from man-made sources is contributing to global warming and climate change.

14.2.6 The seven main GHGs, as defined by the Kyoto Protocol, are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride. In combination, these GHG emissions are commonly expressed in terms of carbon dioxide equivalents (CO2e) according to their relative global warming potential. For this reason the shorthand ‘carbon’ is sometimes used to refer to GHGs.

Climate resilience

14.2.7 The approach to assessment of climate resilience is based upon IEMA's EIA guide²⁸ to Climate change resilience and adaptation as well as the experience of the Project team on other major infrastructure projects.

14.2.8 Climate resilience with respect to the risk of flooding is considered as part of the separate chapter on the water resources and flood risk (Chapter 12) and is not assessed here.

Likely Significant Effects

14.2.9 The impacts in relation to climate resilience relate to how the changing climate may affect the Proposed Development itself in terms of the construction and operation of the infrastructure, its ability to function and the end-users.

14.2.10 The potential impacts of climate change on the Proposed Development are diverse and may include the receptors and aspects set out in **Table 14.6**.

Table 14.7: Potential impacts relating to climate resilience

RECEPTOR	ASPECTS
Geotechnics	Erosion
	Stability of earthworks and compaction
	Earthworks construction across existing landslip
	Increased scour and erosion of earthworks
	Stability of slopes, change in water levels/pore pressure
Structures	Thermal actions (loads) applied to superstructure
	Wind actions (loads) applied to superstructure
	Increased thermal range giving rise to increased earth pressures
	Earth pressures used in design affected by change in ground water level
	Foundation settlement affected by change in ground water level
	Design for increased scour risk for foundations
	Design of structure drainage
	Use of temperature sensitive components or materials in construction or rehabilitation (e.g. epoxies used in fibre reinforced plastic (FRP) strengthening)
	Design, management and maintenance of expansion joints
	Climatic constraints on construction and maintenance activities
Optimum timing of maintenance interventions, in response to changes in deterioration rates	
Operations	Cooling capacity of plant in proposed converter station
Soft estate	Landscape, ecology

14.2.11 Including these elements within the assessment represents a comprehensive and good practice approach to assessing the significance of impacts and effects arising from climate change on the Proposed Development. It also creates an environment

²⁸ IEMA (2015) EIA guide to Climate change resilience and adaptation

in which opportunities to identify and implement enhancements are encouraged alongside the reduction of adverse effects.

14.2.12 The effects of climate change during the decommissioning of the Proposed Development have been excluded due to uncertainty of requirements and processes at the Proposed Development's end of life.

14.3 Assessment Methodology

Greenhouse Gas Assessment

14.3.1 For each of the lifecycle stages which have been scoped in for assessment (see above), the detailed assessment will include the following:

- Collection of data/information on the scale of GHG-emitting activities for the Proposed Development, as well as for the baseline scenario if this is required to show the relative effect. In each case this will cover the trend for the whole study period; and
- Calculation of the GHG emissions using a standard emissions calculation methodology applying a suitable emissions factor.

14.3.2 GHG emissions calculations will be completed using a recognised carbon calculation tool for infrastructure schemes (e.g. Highways England, the Environment Agency, the Rail Safety and Standards Board) supplemented by a bespoke emission calculation model where necessary. GHG emissions will be calculated for each lifecycle stage and reported as tonnes of carbon dioxide equivalents (tCO₂e).

Benchmarking

14.3.3 The total magnitude of GHG emissions (or avoided emissions) occurring during each of the five year carbon budget periods (agreed by the government) will also be reported.

14.3.4 The emissions will be compared to the overall carbon budget for that period (see **Table 14.7**) and expressed in percentage terms.

Table 14.8: UK Government Carbon budgets (Committee on Climate Change²⁹)

CARBON BUDGET PERIOD	UK CARBON BUDGET
Third: 2018-2022	2,544 MtCO ₂ e
Fourth: 2023-2027	1,950 MtCO ₂ e
Fifth: 2028-2032	1,725 MtCO ₂ e

14.3.5 GHG emissions result in the same global climate change effects wherever and whenever they occur and therefore the sensitivity of different human and natural receptors is not considered. There are currently no agreed thresholds for what level of GHG emissions is considered significant in an EIA context.

14.3.6 The GHG assessment will identify a range of potential opportunities for reduction of the magnitude of emissions, focussing on key lifecycle stages.

²⁹ Committee on Climate Change (2017) UK Carbon budgets [[Link](#)]

Climate resilience

14.3.7 Historical and projected (baseline) climate data for the location of the Proposed Development will be used to identify climatic trends which may impact upon the Proposed Development. Having identified the climate change impacts, the effects (hazards/opportunities) of those impacts shall be assessed. The likelihood of the impact occurring shall be assessed using the criteria in **Table 14.8**.

Table 14.9: Qualitative measure of likelihood

LIKELIHOOD OF IMPACT	DESCRIPTION
Frequent	Will occur / recur regularly and/or often
Likely	Will occur / recur on occasion, a persistent issue
Occasional	Will probably occur
Remote	Will occur / recur occasionally
Unlikely	Not expected to occur / recur
Rare	Would only occur / recur in very extreme circumstances

14.3.8 The consequence of the impact will be assessed using the criteria in **Table 14.9**.

Table 14.10: Qualitative measure of consequence

CONSEQUENCE OF IMPACT	DESCRIPTION
Extreme	Operation of the Proposed Development is disrupted resulting in outage >1 week. Severe impact to operation of the site with damage, disruption or closure. Very large numbers of receptors and users affected with severe disruption to the site activities. Severe damage to property and built environment in affected area requiring large capital expenditure.
Major	Operation of the Proposed Development is disrupted resulting in outage between 4 – 7 days. Impact to operation with damage or disruption to the site. Large number of receptors and users in affected area impacted. Disruption to site activities with health and safety risk
Moderate	Operation of the Proposed Development is disrupted between 1 – 3 days. Damage or disruption confined to a specific location of the Site
Minor	Operation of the Proposed Development is disrupted resulting in outage <1 day. Minor, localised, impact to operation of the Site with damage or disruption
None	Impacts give rise to no or negligible effects on identified receptors.
Minor positive	Impacts give rise to small, typically localised, beneficial effects on identified receptors.
Moderate positive	Impacts give rise to larger and/or profound beneficial effects on identified receptors, typically impacts are local.
Major positive	Impacts give rise to particularly large and/or profound beneficial effects on identified receptors. Potential reductions to construction time and costs. Potential improvement to scheme operations.
Extreme positive	Impacts give rise to extremely large and/or profound beneficial effects on identified receptors. Potential substantial reductions to construction time and costs. Potential substantial improvement to scheme operations.

14.3.9 The likelihood and consequence of each impact, be it positive or negative, is combined to give the risk of each effect occurring as shown in **Table 14.10**.

Table 14.11: Climate risk assessment matrix

		Likelihood					
		Rare	Unlikely	Remote	Occasional	Likely	Frequent
Consequence	Extreme	Medium	Medium	High	High	High	High
	Major	Low	Medium	Medium	High	High	High
	Moderate	Low	Low	Medium	Medium	High	High
	Minor	Low	Low	Low	Low	Medium	Medium
	None	Low	Low	Low	Low	Low	Low

14.3.10 The climate resilience assessment will identify a range of potential opportunities for reduction of the risks identified.

15 Human Health

This chapter addresses human health issues in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

15.1 Baseline Conditions

Profile of Local Population Health and Wellbeing, Economy and Noise (ONS, 2015)

15.1.1 Office of National Statistics local profile data³⁰ for the wider study area was analysed to determine how the area performs across a number of indicators which are related to potential health impacts of the proposed converter station, cable route and landfall. These were:

- Population Age Profile;
- Indices of Multiple Deprivation;
- Life Expectancy;
- Mortality from Causes Considered preventable;
- Mortality from Cancer considered preventable;
- Rate of Noise Complaints about noise; and
- Employment rate.

15.1.2 The above data was used to provide a profile of the study area population and health baseline.

Age Distribution

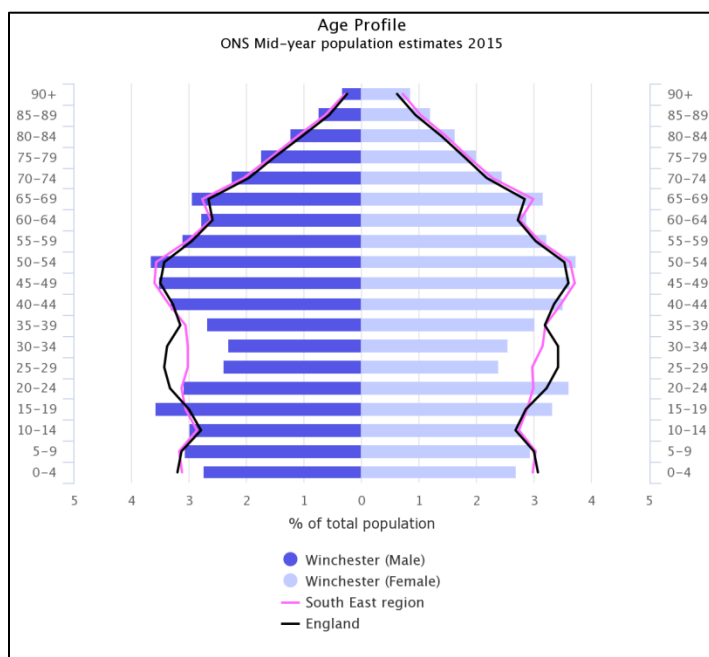
Proposed Converter Station

15.1.3 Age profile for both East Hampshire and Winchester indicate that population of the study area are older than both the regional and national profile, with lower representation of age groups between 20 to 39 years (**Inset 15.1** and **Inset 15.2**).

³⁰ <http://www.phoutcomes.info/public-health-outcomes-framework#page/3/gid/1938132983/pat/6/par/E12000008/ati/101/are/E07000090/iid/91872/age/1/sex/4>



Inset 15.1: Age Population Profile for East Hampshire



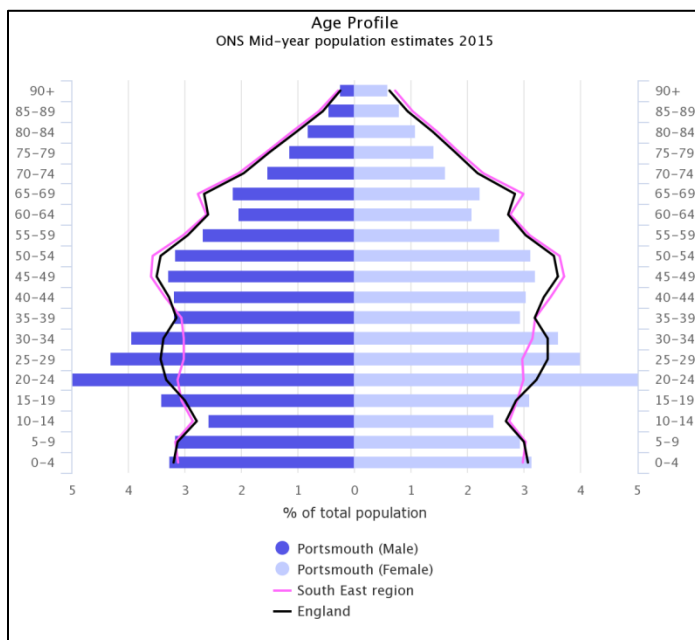
Inset 15.2: Age Population Profile for Winchester

Cable Route and Landfall

15.1.4 The age profile for Havant is similar to those for both East Hampshire and Winchester, however the age population of Portsmouth City is significantly younger than regional or national mean profiles, with a larger population of the age range 20 to 34 years (**Inset 15.3** and **Inset 15.4**).



Inset 15.3: Age Population Profile for Havant



Inset 15.4: Age Population Profile for Portsmouth City Council

Health and Wellbeing profile

15.1.5 Public Health England (PHE) Health Profile³¹ (2016) data was evaluated to determine the health status of the population within the two study areas for the proposed converter station and the cable route and landfall.

*Index of multiple deprivation score (IMD 2015)*³²

15.1.6 Deprivation covers a broad range of issues and refers to unmet needs caused by a lack of resources of all kinds, not just financial. The English Indices of Deprivation attempt to measure a broader concept of multiple deprivation, made up of several distinct dimensions, or domains, of deprivation³³.

15.1.7 In terms of overall deprivation, one three of the study area districts were less deprived than the national average, with Winchester and Havant both significantly less deprived than the national average (**Table 15.1**). Portsmouth however was considered to be deprived and was amongst the within the highest quartile of deprivation in England.

Table 15.1: Study Area Indices of Multiple Deprivation

AREA	INDICES OF MULTIPLE DEPRIVATION (IMD 2015)
England	21.8
South East Region	-
Winchester	8.8
Portsmouth	27.1
Havant	21.2
East Hampshire	8.6

Health and Well-being

15.1.8 Life expectancy across all local authorities within the study areas indicate that on average populations live longer in these areas than England average. However the life expectancy in Portsmouth was observed to be significantly lower than the England average, with the male population having a lower life expectancy of 1.8 years than the national average and female population of Portsmouth having an average life expectancy of 0.9 years than the national average (**Table 15.2**).

³¹ Stoke-on-Trent Health Profile 2016. Association of Public Health Observatories [online]

³² The English Indices of Deprivation 2015 use 37 separate indicators, organised across seven distinct domains of deprivation which can be combined, using appropriate weights, to calculate the Index of Multiple Deprivation 2015 (IMD 2015). This is an overall measure of multiple deprivation experienced by people living in an area.

³³ Department of Communities and Local Government (DCLG), <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>

Table 15.2: Life Expectancy at Birth

AREA	LIFE EXPECTANCY AT BIRTH	
	MALE	FEMALE
England	79.5	83.1
South East Region	80.5	84.0
Winchester	81.6	84.9
Portsmouth	77.7	82.2
Havant	80.1	83.4
East Hampshire	81.7	84.4

15.1.9 Mortality from causes considered preventable across all local authorities within the study areas implies that on average the residents of Portsmouth are less healthy than the population within other parts of the study areas, and less healthy than the average south east local authority or the average England local authority (**Table 15.3**).

Table 15.3: Mortality from Causes Considered preventable

AREA	MORTALITY FROM CAUSES CONSIDERED PREVENTABLE (PER 100,000 POPULATION)
England	184.5
South East Region	161.2
Winchester	135.5
Portsmouth	231.1
Havant	181.7
East Hampshire	133.8

15.1.10 Mortality from cancers considered preventable across all local authorities within the study areas implies that on average preventable cancer is responsible for a greater proportion of deaths amongst residents of Portsmouth than the population within other parts of the study areas. Residents in the two local authorities likely to be affected by the installation of the proposed converter station, Winchester and East Hampshire, experience very low mortality rates from cancers considered preventable (**Table 15.4**).

Table 15.4: Under 75 Mortality from Cancer considered preventable

AREA	UNDER 75 MORTALITY FROM CANCER CONSIDERED PREVENTABLE (PER 100,000 POPULATION)
England	81.1
South East Region	73.6
Winchester	59.7
Portsmouth	97.0
Havant	80.9
East Hampshire	62.1

Noise Complaints

15.1.11 Impacts of noise upon the populations across the study area can be seen to be low in all local authority areas with the exception to Portsmouth, where 10.4 complaints are received per year per 1,000 population (**Table 15.5**). This implies that the noise threshold in Portsmouth may be high, though tolerance to cumulative noise may be low. Low incidence of noise complaints in parts of the study area may account for a low noise baseline, which could result in a low tolerance of incidence noise or noise nuisance.

Table 15.5: Rate of Noise Complaints about noise

AREA	RATE OF NOISE COMPLAINTS ABOUT NOISE (PER 1,000)
England	7.1
South East Region	5.3
Winchester	3.5
Portsmouth	10.4
Havant	3.1
East Hampshire	4.8

Employment and Economy

15.1.12 Levels of employment across the study areas can be seen to be above national average in all local authorities apart from Portsmouth, though below the regional average in all local authorities with the exception to Winchester. The employment rate in Portsmouth is 2.2% below the national average and 5.5% below the regional average (**Table 15.6**).

Table 15.6: Employment rate for those between 16 to 64 years of age (%)

AREA	EMPLOYMENT RATE FOR THOSE BETWEEN 16 TO 64 YEARS OF AGE (%)
England	73.9
South East Region	77.2
Winchester	85.0
Portsmouth	71.7
Havant	74.2
East Hampshire	75.2

15.2 Scope of Assessment

15.2.1 The following key tasks are proposed for the assessment of Human Health for the Proposed Development:

- Conduct an outline screening exercise on the likely health impacts from the Proposed Development upon the study area population, identify potential health impacts and scope out unlikely health impacts for the proposed converter station, the cable route and landfall;
- Determine the type and depth of health assessment required;
- Propose specific study areas for the assessment of health for the proposed converter station, the cable route and landfall;
- Identify relevant scientific evidence from past HIAs and other literature;

- Assess the potential health and wellbeing impacts of the Proposed Development, and the nature and likelihood of such impacts;
- Develop recommendations for minimising potential negative, and maximising potential positive, health and wellbeing impacts; and
- Suggest health and wellbeing indicators that can be used to monitor the construction and operation of the Proposed Development.

Likely Significant Effects of the Proposed Converter Station

- 15.2.2 Potential beneficial health impacts of the proposed converter station are likely to be associated with benefits to the economy and increased economic activity brought about by the construction of the proposed converter station.
- 15.2.3 Potential adverse health impacts of the proposed converter station are likely to be associated with indirect impacts upon health brought about by a reduction in amenity from a reduction in landscape quality and fear of health impacts from the risk to health from Electro-magnetic fields. Additionally a probable adverse impact on health could occur from noise during construction of the proposed converter station, particularly with regards to the relatively rural, tranquil location proposed site location.

Likely Significant Effects of the Cable Route and Landfall

- 15.2.4 Potential beneficial health impacts of the cable route and landfall are likely to be associated with benefits to the economy and increased economic activity brought about by the construction of the cable route and landfall.
- 15.2.5 Potential adverse health impacts of the cable route and landfall are likely to be associated with indirect impacts upon health brought about by increased congestion during the cable laying works. Additionally a probable adverse impact on health could occur from noise during construction of the cable route and landfall, particularly where the cable route is positioned close to sensitive noise receptors.
- 15.2.6 **Table 15.7** below includes all of the potential health determinants and those proposed (shaded) to be included in this health assessment.

Table 15.7: Health Determinants Screened out (Clear) and Screened in (ticked) of the Health Assessment

Health Determinant	Proposed Converter Station		Cable Route and Landfall	
	Likelihood of Health Effect Occurrence	Impacts of health effects upon Study Area Population	Likelihood of Health Effect Occurrence	Impacts of health effects upon Study Area Population
Air quality				
Noise	✓	✓		
Collisions				
Social isolation				
Climate change				
Surface access			✓	✓
Local and national jobs	✓	✓	✓	✓
Apprenticeships	✓	✓		
Business Activity	✓	✓	✓	✓
Exercise and physical activity				
Illicit Drug Use				

Health Determinant	Proposed Converter Station		Cable Route and Landfall	
	Likelihood of Health Effect Occurrence	Impacts of health effects upon Study Area Population	Likelihood of Health Effect Occurrence	Impacts of health effects upon Study Area Population
Smoking habit				
Landscape and Townscape	✓	✓	✓	✓
Access to Nature				
Water Quality				
Land Use	✓	✓		
Natural Habitats	✓	✓		
Soil/ Land Contamination	✓	✓	✓	✓
Hazards				
Public Transport			✓	✓
Wealth Distribution				
Community Participation				
Crime/ Antisocial behaviour				
Housing				
Personal safety	✓	✓	✓	✓
Income				
Access to Services, facilities, and amenities			✓	✓
Access to Greenspace/ Bluespace	✓	✓		
Access to Health care				
Childhood Development				
Level of Income				

15.3 Assessment Methodology

15.3.1 Human Health is assessed using a systematic analysis of the potential direct and indirect health impacts of a Proposed Development. The purpose of a health assessment is to adapt to mitigate negative impacts and reduce health inequalities through recommending opportunities, and where appropriate, enhance a scheme's positive health impacts.

Screening

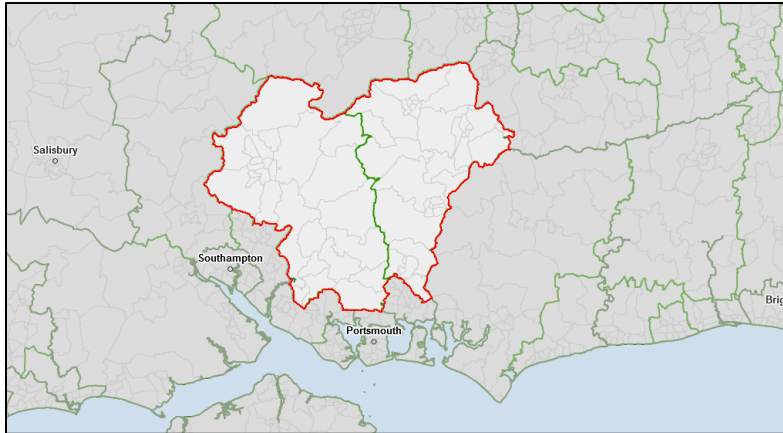
15.3.2 All of the potential health determinants associated with large-scale engineering projects were initially taken into considered and either screened in or out according to likelihood and the potential impact upon the study area and population and vulnerable groups. As an outcome, it is proposed that the following key determinants of health should be assessed for both the proposed converter station and the cable route and landfall installation (**Table 15.8**).

Table 15.8: Proposed Health determinates for this Study

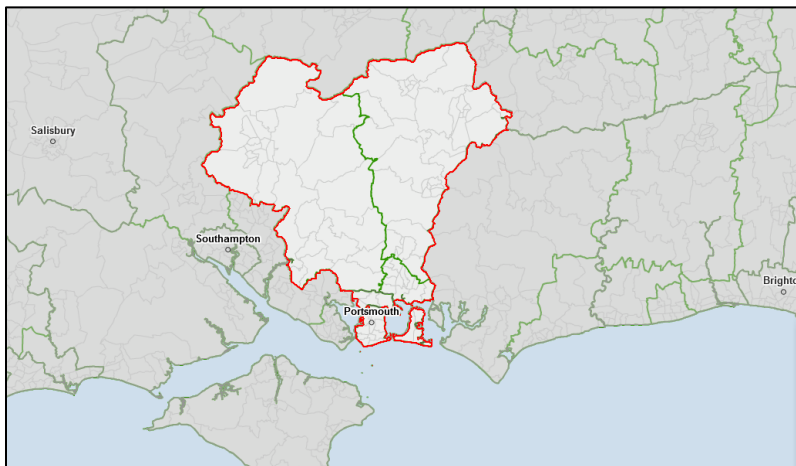
Health Determinant	Proposed Converter Station	Cable Route and Landfall	
Noise	✓		
Surface access		✓	
Local and national jobs	✓	✓	
Apprenticeships	✓		
Business Activity	✓	✓	
Job Creation/ Availability of employment opportunities / Quality of employment opportunities	✓		
Landscape and Townscape	✓	✓	
Land Use	✓		
Natural Habitats	✓		
Soil/ Land Contamination	✓	✓	
Public Transport		✓	
Personal safety	✓	✓	
	Access to Services, facilities, and amenities		✓
	Access to Greenspace/ Bluespace	✓	

Health Impact Assessment

15.3.3 A rapid desktop HIA is recommended for this assessment. This is a desk-based assessment of the direct and indirect effects which are likely to be experienced by those communities (wards) that the Proposed Development is based in. The geographic scope of this Health Assessment are the Local Authority areas of Winchester and East Hampshire for the proposed converter station assessment (**Inset 5.5**) and Local Authority areas of Winchester and East Hampshire, Havant and Portsmouth City for the cable route and landfall assessment (**Inset 5.6**).



Inset 5.5: Proposed Converter Station Site Health Study Area



Inset 5.6: Cable Route and Landfall Health Study Area

15.3.4 The proposed population to be assessed within this HIA is:

- Proposed converter station: Residents within Winchester and East Hampshire; and
- Cable route and landfall: Residents within City of Portsmouth, Havant, Winchester and East Hampshire.

15.3.5 It is proposed that health impacts should be assessed upon the following vulnerable groups:

- Older people;
- People with existing health conditions;
- Unemployed and low income groups; and
- Socially excluded or isolated groups.

Evidence

15.3.6 It is proposed that evidence should be utilised from the following sources:

- Joint Health and Wellbeing Strategy: Working better together to improve health and wellbeing in Portsmouth 2014 - 2017 City Centre and Etruria Road Corridor Area Action Plan HIA³⁴; and
- Hampshire Joint Strategic Needs Assessment 2015³⁵.

Proposed Appraisal of Impacts

15.3.7 Health impacts of the Proposed Development will be assessed against each of the determinants of health, looking first at the baseline conditions of the determinant category within the study area, evidence of how each determinant effects health and then the effect that the Proposed Development has on the health of the target population (short-term, temporary and permanent) via the determinant category.

15.3.8 A seven point assessment scale that classifies the significance of the identified impacts (**Table 15.9**) is used to categorise the effects for the assessment. This approach has been adapted from that used by the Institute of Occupational Medicine (IOM), for the North Staffordshire ‘Streetcar’ Bus Rapid Transport Scheme Health Impact Assessment, IOM, 2009. Significance incorporates the intensity of the impact and its potential duration, shown in **Table 15.9** below.

Table 15.9: Seven point Health assessment scale classifying significance of identified impacts

Significance of Impact	Definition	Intensity [+/-]	Duration (SML) (TIP)
Major Adverse	Health effects are major negative if they lead directly to deaths, acute or chronic diseases or mental ill health. They can affect either or both physical and mental health either directly or through the wider determinants of health and wellbeing. These effects can be important local, district, regional and national considerations. Mitigation measures and detailed design work can reduce the level of negative effect though residual effects are likely to remain.	The exposures tend to be of high intensity. Over a large geographical area or affect a large number of people or impact vulnerable groups. (- - - / + + +)	Long term duration (L) Intermittent (I) Temporary (T) or Permanent (P) in nature
Major beneficial	Health effects are categorised as a major positive if they prevent deaths/prolong lives, reduce/prevent the occurrence of acute or chronic diseases or significantly enhance mental wellbeing would be a major positive.		
Moderate Adverse	Health effects are categorised as a moderate negative if the effects are long term nuisance impacts, e.g. odours and noise, or may lead to exacerbations of existing illness. The negative impacts maybe nuisance/quality of life impacts which may affect physical and mental health either directly or through the wider determinants of health. The cumulative effect of a set of moderate effects can lead to a major effect. These effects can be important local, district and regional considerations. Mitigation measures and detailed design work can reduce and in some/many cases remove the negative and enhance the positive effects though residual effects are likely to remain	The exposures tend to be of moderate intensity and/or over a relatively localised area and/or likely to affect a moderate-large number of people e.g. between 100-500 and/or sensitive groups (- - / + +)	Medium term duration (M) Intermittent (I) Temporary (T) or permanent (P) in nature.
Moderate Beneficial	Health effects are categorised as a moderate positive if they enhance mental wellbeing significantly and/or reduce exacerbations to existing illness and reduce the occurrence of acute or chronic diseases.		
Minor Adverse	Health effects are categorised as minor positive or negative, if	The exposures	Short term duration

³⁴ <http://www.healthycity-stoke.co.uk/upload/docs/City%20Centre%20AAP%20HIA%20-%20FINAL%20REPORT%20-%202023-03-11.pdf>

³⁵ <http://documents.hants.gov.uk/public-health/2015-09-16HampshireJointStrategicNeedsAssessment2015.pdf>

Significance of Impact	Definition	Intensity [+/-]	Duration (SML) (TIP)
Minor Beneficial	they are generally lower level quality of life or wellbeing impacts. Increases or reductions in noise, odour, visual amenity, etc are examples of such effects. These effects can be important local considerations. Mitigation measures and detailed design work can reduce the negative and enhance the positive effects such that there are only some residual effects remaining.	tend to be of low intensity and/or over a small area and/or affect a small number of people e.g. less than 100 (- / +)	(S) Intermittent (I) Temporary (T) or permanent (P) in nature.
Neutral/No	No health effect or effects within the bounds of normal/accepted variation.	N/A	N/A

16 Soils and Land Use

This chapter addresses soils and land use in relation to the proposed converter station, and so is relevant to Winchester City Council and East Hampshire District Council.

16.1 Baseline Conditions

Proposed Converter Station

- 16.1.1 The key feature of national policies regarding the use of agricultural land is the importance of safeguarding finite natural resources in the long-term national interest. For this reason policies governing development within the countryside give a certain level of protection to 'best and most versatile (BMV) agricultural land'. This is land defined as Grades 1, 2 and 3a in the Agricultural Land Classification (ALC) system. Agricultural land affected by the Proposed Development is confined to the site of the proposed converter station. Provisional ALC mapping published at an original scale of One Inch to One Mile (1:63,360) shows the agricultural land affected by the scheme to be of undifferentiated Grade 3 quality.
- 16.1.2 Topography at the locations of Site Option A has a gentle downward slope from north to south, from around 80m to 75m above Ordnance Datum (AOD). Site Option B occupies a gentle to moderate slope, with altitude falling from around 85m to 70m AOD.
- 16.1.3 Published soil association mapping shows the Carstens association to be mapped at the proposed converter station site. These soils are characterised by fine silty over clayey, clayey or fine silty soils, which are often very flinty. Although clayey in subsoil horizons they are rarely waterlogged and often of WC I.
- 16.1.4 Detailed ALC data available in the vicinity of the proposed converter station site within the same mapped soil type shows agricultural land quality to vary from Subgrade 3a to Grade 4.
- 16.1.5 There are three farm holdings close to the proposed converter station site. Millfield Farm is located to the west, Little Denmead Farm to the south and Broadway Farm House and Barns to the east.
- 16.1.6 Site Option A sites the proposed converter station approximately 450m to the south of the current National Grid substation, within a large arable field.
- 16.1.7 Site Option B sites the proposed converter station approximately 103m to the west of the substation site, within some permanent pasture fields, and could potentially remove approximately 110m of hedgerow.

Cable Route and Landfall

- 16.1.8 The proposed landfall would not involve the loss of any agricultural land or resources. The cable route mainly follows existing highways and would not involve the loss of agricultural resources, following the A288, A2030, B2177 and A3 towards the proposed converter station and substation at Lovedean.
- 16.1.9 Most of the cable route would be on non-agricultural land, with the section between Horndean to the proposed converter station at Lovedean shown as undifferentiated Grade 3 land on the Provisional ALC map.

16.2 Scope of Assessment

- 16.2.1 Impacts on agricultural land quality, soil resources and local farm businesses could occur during the construction stage of the Proposed Development.
- 16.2.2 The proposed scope of the assessment will include the establishment of baseline conditions for each receptor, the impact of the Proposed Development on the receptor and the potential resultant effect.
- 16.2.3 Receptors taken into consideration during the construction stage of the Proposed Development will include BMV agricultural land, soil resources and farm holdings. Potential impacts of the Proposed Development may include the loss of BMV agricultural land; the loss of, or damage to, the soil resources and the impact on the viability of the farm holdings.

16.3 Assessment Methodology

- 16.3.1 There is an established methodology for classifying the quality of agricultural land within England and Wales. The methodology is contained within guidance issued by the former Ministry for Agriculture, Fisheries and Food (MAFF) in 1988. All agricultural land in England and Wales is graded from 1 to 5, dependent on the extent to which physical or chemical characteristics of the soil impose long-term limitations on the agricultural use of the land.
- 16.3.2 Grade 1 land is considered excellent quality agricultural land with either no, or very minor limitations on its agricultural use. Grade 5 is considered to be very poor quality land, with severe limitations due to adverse soil, relief, climate or a combination of these factors. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land).
- 16.3.3 There is no existing detailed ALC survey data available for the agricultural land affected by the Proposed Development. A detailed ALC survey will be required in order to establish baseline conditions. An ALC survey will involve an interpretation of published geographical, topographical, soil and agro-climatic information in light of the ALC guidelines. This will be followed by a site survey examining soil profiles using hand-held augers and spades. Soil samples may be taken for laboratory analysis. The soil characteristics will then be described and analysed in accordance with the MAFF guidelines to determine the agricultural land quality.
- 16.3.4 Information on the existing agricultural use and circumstances of the sites will be obtained primarily from the existing occupiers and owners. The information collected will include a description of the size, location and use of farm holdings. Also included will be the existing scale and nature of agricultural and non-agricultural enterprises based on farm holdings and their associated capital and labour inputs. By doing this an assessment can be made of potential impacts on farm viability and other farm businesses affected by the Proposed Development.

Methodology for Determining Significance

- 16.3.5 The significance of the effect of the Proposed Development on agricultural resources will be determined by combining the sensitivity of the receptor with the magnitude of the impact arising from the Proposed Development.
- 16.3.6 The sensitivity of agricultural land will be determined according to its quality within the ALC system. Grade 1 land is considered the most sensitive to change and Grade 5 land the least sensitive.

- 16.3.7 Sensitivity of the soil will be determined according to its texture and its propensity to damage from compaction and smearing. Heavy clay soils are the most sensitive to movement and handling, with light, sandy soils being the least sensitive.
- 16.3.8 The sensitivity of the farm holding will be determined according to the type and scale of the enterprise. Those enterprises that rely directly on key, fixed infrastructure or frequent movements between land and buildings, for example dairy farms, are the most sensitive to change and severance during the construction of the Proposed Development. Small farm holdings are also highly sensitive to change.
- 16.3.9 The magnitude of impact on agricultural land and soil resources will reflect the scale of the Proposed Development, and will have regard to existing consultation procedures with Natural England for the development of agricultural land. The magnitude of impact on the farm holding will primarily be reflected in the area of land that is not available to the farm during the construction of the Proposed Development and the degree of severance caused.

Mitigation Measures

- 16.3.10 The ES will act to identify mitigation measures to conserve and reuse the soil resource on site in a sustainable manner; and any necessary measures to reduce any adverse impacts on farm holdings associated with the Proposed Development.
- 16.3.11 There is no universally applicable measure to mitigate against the direct loss of agricultural land as a result of development. However effects on soil resources can be mitigated by implementing a soil resources plan, indicating the soil types affected; the most appropriate re-use strategy for the different types of soils and any proposed methods for the handling, storage and replacing of soils on site.
- 16.3.12 The aim of a soil resources plan is to re-use as much of the surplus soil on-site in a sustainable manner in a use appropriate to the soil's quality. This will be done in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils.

17 Electric and Magnetic Fields

This chapter addresses Electric and Magnetic Fields in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

17.1 Introduction to Electric and Magnetic Fields

- 17.1.1 Electric and Magnetic Fields (EMFs), and the associated electromagnetic forces, are a fundamental part of the physical world. Their sources are electric charges (source of the electric field) and the movement of those charges (source of the magnetic field). Electromagnetic forces are partly responsible for the cohesion of material substances and they mediate all the processes of chemistry, including those of life itself. EMFs occur naturally within the body in association with nerve and muscle activity. People are also exposed to the natural magnetic field of the Earth (to which a magnetic compass responds) and natural electric fields in the atmosphere.
- 17.1.2 It has become common practice to report magnetic fields in units of microtesla (μT) or nanotesla (nT). One nanotesla is one thousandth of a microtesla. Microtesla is used throughout this chapter.
- 17.1.3 Electric-field strengths are measured in volts per metre (V/m) or kilovolts per metre (kV/m). One kilovolt per metre is one thousand volts per metre. Atmospheric static or “dc” electric fields at ground level are normally between 10 – 130 V/m in fine weather and may rise to many thousands of volts per metre during thunderstorms.
- 17.1.4 The direction of the Earth’s magnetic field is normally constant, varying in size only slowly over time, and is referred to as a static or “DC” field. The Earth’s magnetic field is approximately 50 μT in the UK. Other fields that alternate in their intensity more frequently over time are referred to as alternating or “AC” fields.
- 17.1.5 All wiring, equipment, and other conductors connected to the electric power system are sources of EMFs. In the UK and Europe the fundamental power frequency of ac systems is 50 Hertz (Hz) corresponding to the extremely low frequency (ELF) range. DC equipment produces static fields which do not vary with a fixed frequency.
- 17.1.6 Fields due to electrical equipment add to (or modulate) the Earth’s steady natural fields. The strength (or amplitude) of the electric-field modulation depends on the voltage of the transmission equipment. As the voltage level supplied to power conductors is regulated, the electric field remains more or less constant as long as the equipment is energised. Conversely, the strength of the magnetic-field modulation depends on the current (often referred to as the load) carried by the equipment, which varies according to the demand for power at any given time.

17.2 EMF Exposure Guidelines

Electric and Magnetic Field Exposure Guidelines at 50 Hz Frequency

- 17.2.1 In the UK, there are presently no statutory regulations to limit public exposure to power-frequency electric or magnetic fields. However, in 2004 the National Radiological Protection Board (NRPB) provided advice to Government³⁶, recommending the adoption in the UK of public exposure guidelines published in

³⁶ NRPB advice to Government: “Advice on Limiting Exposure to Electromagnetic Fields (0-300 GHz)” Documents of the NRPB Volume 15 No 2 2004.

1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP)³⁷ in terms of the 1999 EU Recommendation³⁸.

17.2.2 The guidelines are designed to set conservative exposure levels for the general public to 50 Hz electric and magnetic fields, and they are endorsed by the UK's Health Protection Agency, the World Health Organisation and the UK Government. A summary of the 1998 ICNIRP guidelines for 50 Hz exposure to the general public is provided in **Table 17.1**.

17.2.3 In 2010, ICNIRP produced new guidelines, but these do not automatically take effect in the UK. The UK policy for public exposure remains based on 1998 ICNIRP until the UK Government decides otherwise.

Table Error! No text of specified style in document.7.12: Summary of the public exposure 50 Hz UK guidelines based on 1998 ICNIRP

BASIC RESTRICTION			
1	ICNIRP Basic Restriction mA/m ² Induced current density in central nervous system	2mA/m ² for the general public	
PRACTICAL EXPOSURE MEASURES			
		50 Hz Electric Fields	50 Hz Magnetic Fields
2	Field strengths corresponding to the <u>Basic Restriction</u>	9,000 V/m	360 µT
3	ICNIRP Reference Level field strengths, below which no further action is necessary, and above which further investigation may be warranted	5,000 V/m	100 µT

17.2.4 **Table 17.1** contains two types of guidelines from ICNIRP. The first type, “Basic Restriction”, the EU recommends³⁹ as the maximum current density to be induced in the central nervous system of an individual “when the time of exposure is significant”.

17.2.5 Current density, however, is a quantity that cannot realistically be measured in people, so Public Health England (formerly Health Protection Agency) also provided a second, more practical guideline – field strengths. Type 2 in the table gives field strengths that are measurable practically and that are considered to correspond with the Basic Restriction.

17.2.6 Line 3 in the table – ICNIRP Reference Level field strengths - are yet more conservative values that would, under all normal circumstances, be expected to induce current densities significantly less than the Basic Restriction. Research by Dimbylow⁴⁰ indicates that the field strengths quoted as corresponding to the Basic Restriction (line 2) act as good, if slightly conservative, equivalents to the 1998

³⁷ ICNIRP guidance: “Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)”. Health Physics April 1998, Volume 74, Number 4:494-522.

³⁸ Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz), Official Journal of the European Communities, 1999/519/EC.

³⁹ Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz), Official Journal of the European Communities, 1999/519/EC.

⁴⁰ Development of the female voxel phantom, NAOMI, and its application to calculations of induced current densities and electric fields from applied low frequency magnetic and electric fields. Dimbylow P. Phys Med Biol. 2005 Mar 21;50(6):1047-70. Epub 2005 Feb 23.

ICNIRP Basic Restriction for the general public, and for this reason the Basic Restriction figures in line 2 of **Table 17.1** are generally considered more relevant to electrical equipment than the Reference Levels of line 3.

- 17.2.7 A UK voluntary Code of Practice⁴¹ describes how compliance with the exposure limits is demonstrated including details of acceptable calculations and the conditions that compliance are assessed for.

Static Electric and Magnetic Field Exposure Guidelines

- 17.2.8 The UK Government's policy with regard to static fields is based upon the 1999 EU Recommendation⁴² and NRPB's 2004 advice⁴³ based on the 1994 ICNIRP exposure guidelines for members of the public for static magnetic fields⁴⁴. A limit of 40 millitesla (40,000 μ T) is defined for the continuous exposure of members of the general public. Although the public exposure limit for static magnetic fields was increased to 400 mT in the 2009 ICNIRP publication, UK guideline limits remain at the lower value in accordance with the 1999 EU Recommendation

- 17.2.9 The 1999 EU Recommendation does not contain any limits for static electric fields. Instead, there is a statement:

“No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.”

- 17.2.10 No limits for static electric fields are given in the NRPB's 2004 advice either, but it states:

“Where direct perception of static electric fields causes annoyance, or indirect effects of electrostatic discharge cause pain, it is important to reduce the possibility of occurrence of these effects. The threshold for perception of static electric fields is around 20 kV/m, and sensations become annoying above about 25 kV/m.”

17.3 Appraisal Methodology

- 17.3.1 The appraisal methodology is to be based upon the industry Code of Practice on Compliance⁴⁵ which specifies that compliance should be specifically demonstrated for cables above 132 kV and substations containing air-cored reactors.
- 17.3.2 The Proposed Development uses both AC and DC technologies, so both AC and static electric and magnetic fields will be produced and are to be considered within the EMP assessment. High-voltage electrical equipment can create, or channel, electromagnetic emissions over a wide range of frequencies; however, only 50 Hz and static electromagnetic fields should be considered.

⁴¹ Power Lines: Demonstrating compliance with EMF public exposure guidelines. A Voluntary Code of Practice. Department of Energy and Climate Change March 2012.

⁴² Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz), Official Journal of the European Communities, 1999/519/EC.

⁴³ NRPB advice to Government: “Advice on Limiting Exposure to Electromagnetic Fields (0-300 GHz)” Documents of the NRPB Volume 15 No 2 2004.

⁴⁴ ICNIRP, 1994: “ICNIRP Guidelines on limits of exposure to static magnetic fields”. Health Physics 1994, Volume 66, Number 1:100-106.

⁴⁵ Power Lines: Demonstrating compliance with EMF public exposure guidelines. A Voluntary Code of Practice. Department of Energy and Climate Change March 2012.

- 17.3.3 Electric and magnetic field strengths shall be calculated using standard equations based on fundamental properties, with consideration of conditions outlined in the aforementioned Code of Practice. Accordingly, the calculation of EMF shall always be referenced to a height of 1m above ground level. The acceptability of the prospective field strengths shall be judged by comparing the results of the calculations with the appropriate ICNIRP guidelines.

18 Waste and Material Resources

This chapter addresses Waste and Material Resources in relation to the proposed converter station, cable route and landfall, therefore is relevant to all LPAs.

18.1 Baseline Conditions

18.1.1 The following sections describe the regional (and in the case of materials, national) baseline conditions for the three elements considered in this chapter: materials, arisings and waste. The analysis has been provided for the south east of England – the region in which all of the works for the Proposed Development will be conducted.

Proposed converter station

18.1.2 The proposed converter station will be established adjacent to the Lovedean substation. The typical layout for a converter station of this nature will comprise a footprint (including grounds and security fencing) of approximately 200m x 200m. No further details on the volume or type of materials required for construction are available at this stage.

18.1.3 Site Option A for the proposed converter station is located entirely within arable farmland, the current site for which is devoid of both trees and hedgerows. Site Option B is also located on a Greenfield site (again, arable farmland) but will require the removal of trees and hedgerows if taken forward.

18.1.4 For both proposed converter station options, a temporary laydown area (1 – 2 ha) would be required during construction, but would be reinstated following demobilisation. An additional laydown area of approximately 20 x 20m would also be required to temporarily store cabling.

18.1.5 Landscaping will be required around the perimeter of the chosen site to integrate the proposed converter station into the surrounding environment. Grading of the land will also be necessary to level the construction platform. The materials generated from this will depend on the excavation depth and footprint of the proposed converter station.

18.1.6 A new access road will be established from the existing road network via Broadway Lane to service construction vehicles; the new road will be retained in operation to give staff access to the Site.

Cable route and landfall

Converter station to landfall

18.1.7 Between the UK landfall and the proposed converter station, four HVDC cables and fibre optic cables are to be installed mainly along local roads, where there is enough space available for excavation, installation, stockpiles and access/egress of the equipment, service cars and construction plant. The materials generated will depend on the cross section of the trenches required for burying the cables.

18.1.8 Where HDD is used to run cables past larger constraints (railways, crossing of main roads and water ways), temporary construction areas (50 x 50m) and TJBs, 1.5-3m deep, 3m in width and 12m in length) will also be required. These will require the additional consumption of materials, and will generate arisings that may need to be disposed of as waste.

18.1.9 Typical materials required for laying the HVDC cabling will include wiring, cross-linked XLPE insulation, concrete protection slabs, a range of backfill materials including cement-bound sand (subject to design confirmation) at the level of the cables. No details on the precise volumes or specifications of these materials is currently available.

400kV AC

18.1.10 400kV AC cables will be laid between the proposed converter station and Lovedean substation, across agricultural land. The excavation volumes will depend on the cross section of the trenches.

18.1.11 Typical materials required for laying the 400kV AC cabling will be similar to that required for laying HVDC cables. No details on the precise volumes or specifications of these materials is currently available.

Materials

18.1.12 For the cable route, it is expected that the current consumption of materials would be limited to that which is required for the maintenance and operation of the existing highway network. Materials would likely include specialist components (e.g. light bulbs, signage steelwork for replacement barriers) as well as some bulk material (asphalt for minor re-surfacing) for routine works and repairs of the highway and ancillary infrastructure.

Availability of construction materials in the south east and UK

18.1.13 **Table 18.1**^{46, 47, 48, 49, 50, 51} provides a summary of the availability of the main construction materials in south east England and the UK, as required to deliver a typical cabling project.

Table 18.1: Materials availability in the South East of England and the UK

MATERIAL TYPE	AVAILABILITY (2015 UNLESS OTHERWISE STATED)	
	SOUTH EAST	UK
Asphalt*	3.6Mt	26.3Mt
Concrete blocks [#]	541,000m ³ (2014)	5.4Mm ³ (2014)
Copper [^]	(no data)	22,800t (2014)
Permitted crushed rock*	1.0Mt	99.3Mt
Polyethylene	(no data)	(no data)
Primary aggregate*	13.3Mt	183Mt
Ready-mix concrete ⁺	0.6Mm ³	25.2Mm ³
Recycled and secondary aggregate*	3.7Mt (2013, consumption)	63Mt
Sand and gravel ⁺	18.8Mt	52.5Mt

⁴⁶ Defra, Construction Building Materials (Jan 2016) [\[link\]](#) Accessed 18 Sep 2017

⁴⁷ South East Aggregates Working Party, Monitoring Report 2013, [\[link\]](#) Accessed 18 Sep 2017

⁴⁸ British Geological Society, Minerals Produced in the United Kingdom in 2014 [\[link\]](#) Accessed 18 Sep 2017

⁴⁹ Mineral Products Association, Mineral Products Industry at a Glance (2016) [\[link\]](#) Accessed 18 Sep 2017

⁵⁰ World Steel Organisation, Monthly Crude Steel Production [\[link\]](#) Accessed 18 Sep 2017

⁵¹ British Geological Society (2016), United Kingdom Minerals Yearbook (2015) Open Report OR/16/021 [\[Link\]](#) Accessed 20 Sep 2017

MATERIAL TYPE	AVAILABILITY (2015 UNLESS OTHERWISE STATED)	
	SOUTH EAST	UK
Steel ⁺	(no data)	7.6Mt (2016)

stocks + production - sales ^ consumption

Arisings

18.1.14 It is anticipated that arisings within the boundary of the Proposed Development are negligible.

18.1.15 The Proposed Development will generate arisings that, subject to condition and structural integrity, have the potential to be diverted from landfill.

18.1.16 The regional context for an environmental assessment of arisings is provided below.

Transfer, treatment and metal recycling in England and the South East

18.1.17 Environment Agency data ⁵² (**Table 18.2**) show that within England, the recovery rate for non-hazardous construction and demolition arisings has remained above 90% since 2010. This exceeds the EU target of 70%, which the UK must meet by 2020⁵³.

18.1.18 No regional data for construction, demolition and excavation (CDE) production or recovery rates are currently available for south east England (see Section 18.6).

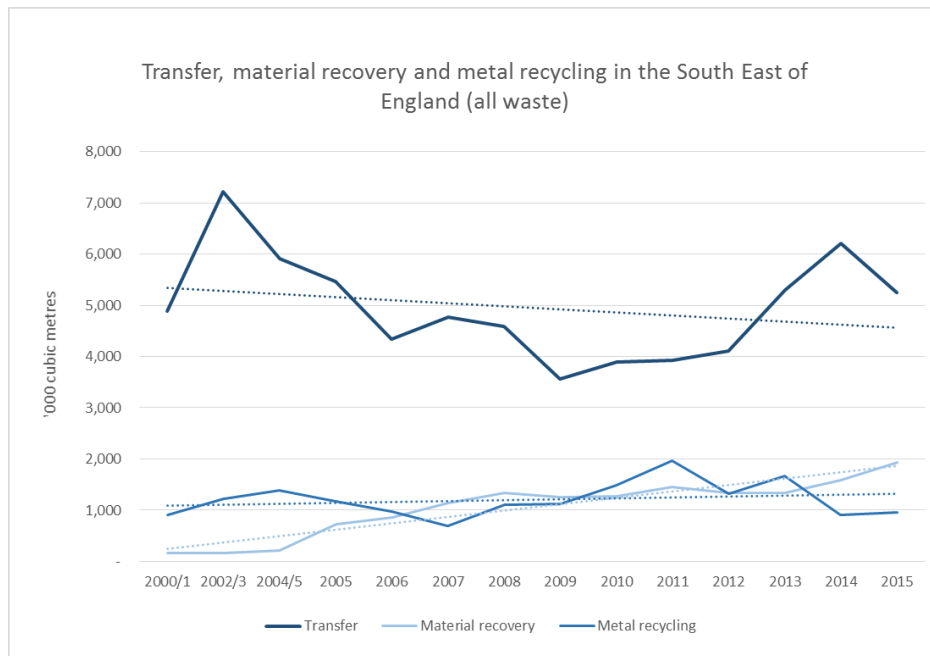
Table 18.2: Non-hazardous construction and demolition arisings recovery in England

YEAR	GENERATION (MT)	RECOVERY (MT)	RECOVERY RATE (%)
2010	43.9	39.7	90.5%
2011	44.1	39.9	90.6%
2012	45.3	41.3	91.1%
2013	46.3	42.1	91.1%
2014	49.1	44.9	91.4%

18.1.19 **Inset 18.1** shows that rates of material recovery within south east England have risen steadily over the past 15 years. Metal recycling shows a consistent, and relatively flat profile. Transfer data are, however, more variable, and no clear profile is discernible. Data provided include all waste types in the south east and hence will include, but are not specific to, CDE arisings.

⁵² Environment Agency, Transfer and treatment deposits by site type, waste type and sub-region, North East [\[link\]](#)

⁵³ Defra (2016) UK Statistics on Waste [\[Link\]](#)



Inset 18.1: Transfer, material recovery and metal recycling in South East England

18.1.20 Whilst trends for transfer, recovery and metal recycling in the south east display different characteristics, data indicates that there is likely to be regional infrastructure and capacity for the sustainable management of CDE arisings from the Proposed Development. Non-hazardous construction and demolition recovery trends across England (**Table 18.2**) demonstrate further capacity in this context.

Waste

18.1.21 It is anticipated that waste generated and disposed of within the boundary of the Proposed Development are negligible.

18.1.22 During construction the generation of volumes of arisings that may need to be disposed of as waste is significantly more likely, and has the potential to adversely impact on landfill capacity.

18.1.23 The regional context for an environmental assessment of waste is now provided.

Remaining landfill capacity in the south east

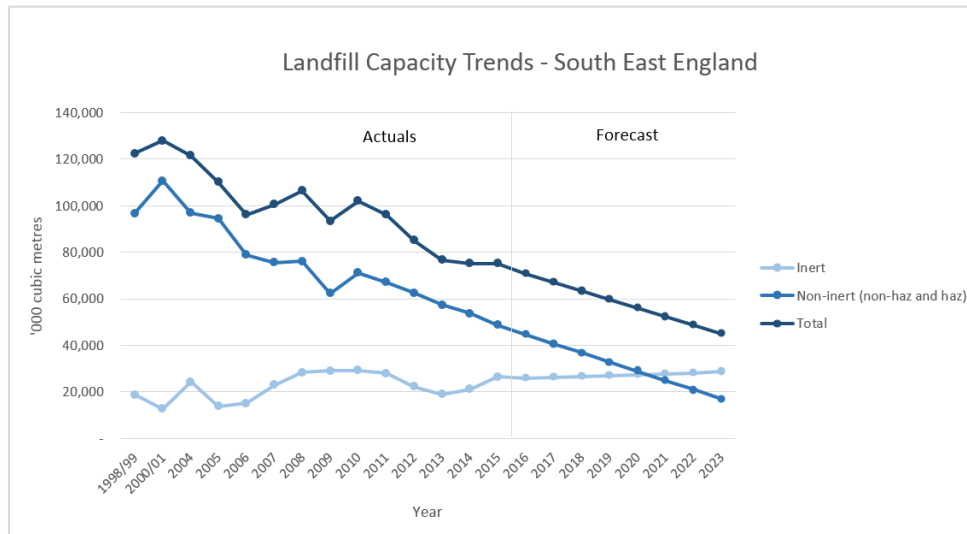
18.1.24 At the end of 2015, 91 landfill sites in the south east were recorded as having 75.2Mt of remaining capacity (**Table 18.3**)⁵⁴.

Table 18.3: Remaining landfill capacity, South East England

LANDFILL TYPE	REMAINING CAPACITY M ³ (2015)
Hazardous (merchant and restricted)	630,000
Inert	26,530,707
Non-hazardous (including stable hazardous waste cells)	48,037,155

⁵⁴ Environment Agency, 2015 Remaining Landfill Capacity – Operator Site Submissions [link] Accessed 18 Sep 2017

18.1.25 **Inset 18.2** shows the remaining landfill capacity in the south east of England, and uses simple forecasting to indicate how this trend will continue in the absence of future recovery provision to the first full year of operation.



Inset 18.2: Landfill capacity trends in the South East of England

18.2 Scope of Assessment

Scope

18.2.1 The scope of the assessment of materials will include:

- The consumption of materials and products (from primary, recycled or secondary, and renewable sources, and including materials offering sustainability benefits), as well as the generation and use of arisings recovered from the Proposed Development; and
- The production and disposal of waste to landfill.

18.2.2 The assessment of materials will specifically exclude (scoped out):

- Lifecycle assessment (including embodied carbon and water) of materials and arisings, and waste. The effort and resources required to undertake a full lifecycle assessment of these elements are deemed disproportionate to the benefit they would offer the assessment of significance of effect; and
- Materials consumption, and arisings and waste production beyond the first full year of operation have been scoped out, as their impacts and associated effects have been deemed to be not significant.

Likely Significant Effects

18.2.3 The impacts of the Proposed Development from materials and arisings, and waste generation and disposal, are likely to occur on-site, off-site within the UK and, potentially, internationally.

18.2.4 It is expected that most direct and indirect impacts will occur during construction and the first full year of operation. Impacts arising further into the operational lifecycle of the proposed converter station and cable route are expected to be negligible, and hence have been scoped out of this chapter. Likely impacts are set out in **Table 18.4**.

Table 18.4: Impacts of consuming materials and disposing of waste, and from diverting arisings from landfill

ELEMENT	DIRECT ADVERSE IMPACTS	INDIRECT ADVERSE IMPACTS
Materials	Consumption of natural and non-renewable resources	<ul style="list-style-type: none"> • release of greenhouse gas emissions • water consumption and scarcity • environmental degradation and pollution • nuisance to communities (visual, noise, health)
Waste	Generation and disposal of waste	<ul style="list-style-type: none"> • release of greenhouse gas emissions • environmental degradation and pollution • nuisance to communities (visual, noise, health)
Arisings	Reduction in the consumption of natural and non-renewable resources	<ul style="list-style-type: none"> • reduction in greenhouse gas emissions • reduced water consumption • environmental preservation • reduced nuisance to communities

18.3 Assessment methodology

- 18.3.1 The following methodology will be used to assess the effects of the consumption of materials (including the production and use of arisings), and the generation and disposal of waste associated with the Proposed Development.
- 18.3.2 The methodology is based on guidance set out in Interim Advice Note (IAN) 153/11 Environmental Assessment of Material Resources⁵⁵ which represents current best practice. With a primary focus on reducing the impacts of materials and waste from construction activities in the highways sector, it is the professional judgement of the author of this chapter that IAN 153/11 is appropriate for use on the cable routing elements of the Proposed Development. The general ethic and principles of the guidance are also applicable to the proposed converter station development, as well.
- 18.3.3 In accordance with the scale and nature of the Proposed Development, a detailed assessment of materials is proposed.
- 18.3.4 The assessment will take into account the impacts of the Proposed Development during construction, and for the first full year of operation.

Materials

- 18.3.5 An assessment of the effects of consuming materials required during construction plus the first full year of operation will be undertaken by considering the origins and sources of materials, including their general availability (production, stock, sales) and the proportion of re-used or recycled materials they contain.
- 18.3.6 The assessment will take into account the relative volume of materials that need to be consumed, understanding that – typically – the larger a development footprint and associated groundworks, the greater the requirement to consume materials.
- 18.3.7 In general, it is expected that the consumption of natural and non-renewable resources will result in adverse effects.

⁵⁵ Highways Agency (2011) Interim Advice Note 153/11 Environmental Assessment of Material Resources [[Link](#)] Accessed 20 Sep 2017

Arisings

- 18.3.8 Arisings (from CDE activities) will be evaluated to determine the volume of excavations that can be retained for re-use or recycling i.e. diverted from landfill.
- 18.3.9 The assessment will take into account the nature of impacts (adverse/beneficial, permanent/temporary, direct/indirect) from arisings, and use professional judgement to determine the significance of effect.
- 18.3.10 In general, it is expected that the re-use and recycling of arisings will result in beneficial impacts.

Landfill capacity

- 18.3.11 An assessment of the remaining landfill capacity in south east England (including the London area) will be used to determine the impacts and effects of waste generated during construction and the first full year of operation, for the Proposed Development.
- 18.3.12 The assessment shall consider the volume of waste generated and the potential impacts and effects of each on remaining landfill capacity. The assessment will be completed for inert, non-hazardous and hazardous waste types.
- 18.3.13 The assessment will take into account the nature of impacts (adverse/beneficial, permanent/temporary, direct/indirect) from waste generated and disposed of, and use professional judgement to determine the significance of effect.
- 18.3.14 In general, it is expected that the generation of waste and its disposal to landfill, will result in adverse impacts.
- 18.3.15 UK landfill operators can claim commercial confidentiality for their data at time of submission; data for sites with a commercial confidentiality in place are unavailable for the analyses presented in this chapter.

Data requirements

- 18.3.16 **Table 18.5** provides an indication of the types of data and information that – where available – will be analysed during the environmental assessment of the Proposed Development.

Table 18.5: Information and data requirements for materials

ELEMENT	INFORMATION AND DATA REQUIRED
Materials	<ul style="list-style-type: none"> • the type and volume of materials to be consumed (a Bill of Quantities) • details of on-site storage and stockpiling arrangements, and any supporting logistical details • the type and volume of materials that will be recovered from off-site sources for use on the Proposed Development. • information on any materials that will comprise entirely (or incorporate) secondary or recycled content • the source and origin of materials to be consumed • information on any known sustainability credentials of materials to be consumed

ELEMENT	INFORMATION AND DATA REQUIRED
CDE arisings	<ul style="list-style-type: none"> • the type and volume of CDE (including remediation) arisings to be generated • an On-site Recovery Index, which describes the percentage of demolition, remediation and earthwork arisings that will be diverted from landfill, and reused, recycled or stockpiled for high value future use either on-site or in other applications e.g. on other projects. • any physical, chemical or other processing, and storage requirements that needs to be deployed to ensure arisings are used their highest value • details of on-site storage and stockpiling arrangements, and any supporting logistical details • the capacity of identified materials treatment or recycling facilities able receive the type and volume of arisings forecast, where they cannot be re-used on or off site • the cut and fill balance (including a description of whether this comprises net loss, balanced, net gain) <p>Defra has confirmed that no CDE data are published at the regional level, and only national (England) data are accessible through the publically available Waste Data Interrogator Database (as held and operated by the Environment Agency).</p> <p>Defra quoted that: <i>“The methodology used to generate these figures is complex, in order to take into account the inherent double-counting and data gaps that are present within waste system data, and it would not be feasible to reproduce these on a regional basis.”</i></p> <p>Until such a time that CDE generation and recovery rates by region are available, transfer (non-civic), recovery and metal recycling data (available through the Waste Data Interrogator Database) will be used as the closest possible proxy.</p>
Waste to landfill	<ul style="list-style-type: none"> • the type and volume of CDE and operational waste to be sent to landfill • the % of all CDE and operational waste to be sent to landfill by type • the capacity of identified landfill sites to receive the type and volume of waste forecast

Assessing the significance of effects

18.3.17 In order to assign a significance of effect category to assessed materials, arisings and waste, the information in **Table 2.4** in DMRB Volume 11 Section 2 Part 5 HA 205/08⁵⁶ (as replicated in **Inset 18.3**) will be applied.

⁵⁶ DMRB olume 11 Section 2 Part 5 HA 205/08 Determining Significance of Effects, Table 2.4, page 20 of 27

		MAGNITUDE OF IMPACT (DEGREE OF CHANGE)				
		No change	Negligible	Minor	Moderate	Major
ENVIRONMENTAL VALUE (SENSITIVITY)	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Inset 18.3: Matrix for assigning the significance of effect

18.3.18 The descriptions provided in **Table 18.6** will be used to define the significance of effect from each element (materials, arisings, waste) assessed.

Table 18.6: Definitions for significance of effect

SIGNIFICANCE CATEGORY	DESCRIPTION OF EFFECT
Very large	Potential for extremely detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.
Large	Potential for considerable detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.
Moderate	Potential for noticeable detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.
Slight	Potential for limited or barely perceptible detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.
Neutral	No detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.

Design, mitigation, enhancement and monitoring measures

18.3.19 To date, specific design measures identified that will mitigate adverse impacts from materials consumption and the generation and disposal of waste, and that will maximise benefits derived from arising re-use / recycling, include:

- Ground and local environment inspections and surveys will be carried out to determine the nature of the ground, to identify its potential to be diverted from landfill;
- Where possible, the use of HDD or other trenchless techniques to minimise the need to generate open trenches;
- Spoil and rubbish segregation and containment on temporary laydown areas;
- A drive to balance cut and fill at the proposed converter station site. For example, materials excavated on higher parts of the site will be used to fill lower levels in order to minimise exportation. The option to increase the excavated material cut from the site to decrease the overall visual impact of the building will also be investigated;
- Both onshore and offshore cables are designed not to require any maintenance;

- The proposed converter station will (at end of life) be decommissioned in accordance with the current waste disposal regulations;
- At the end of the marine cable's 40 year design, the options for decommissioning will be evaluated. In some instances, the least environmentally impacting option may be to leave the cable in-situ. The final decommissioning plan is still to be determined, and may depend on requirements and the marine environment at the time; and
- When decommissioning onshore cables, every effort will be made to re-use and recycle as much material as possible.

18.3.20 It would be expected that monitoring measures to be adopted across the Proposed Development would include – as a minimum – the implementation of a CEMP, Materials Management Plan (MMP) and Site Waste Management Plan (SWMP). Associated data, information and reports will be used to evidence monitoring undertaken.

Appendix 1 - Scope of the EIA for the Application

ES DISCIPLINE	POTENTIAL EFFECT	SCOPED IN	SCOPED OUT	REASONS
Traffic and Transport	Employees during the operational stage of the Proposed Development.		✓	In traffic and transportation terms, the small number of employees at the proposed converter station will be insignificant.
	Nuisance and disruption to users of the local road network from construction traffic proposed (converter station).	✓		Local receptors including vehicles, pedestrians, equestrians and cyclists.
	Fear and intimidation, increased traffic delay, severance and road safety impacts on residents from construction traffic (proposed converter station).	✓		There are residents within the local area that live alongside construction traffic routes.
	Cumulative effect of road closures and traffic diversions (cable route).	✓		Users of the local road network, including vehicles, pedestrians, equestrians and cyclists could be impacted.
Air Quality	Generation of dust and particulate matter during site preparation and construction.	✓		Proximity of Proposed Development to human and ecological receptors.
	Increases in pollutant concentrations due to exhaust emissions from construction vehicle and plant.	✓		Proximity of Proposed Development to human and ecological receptors.
	Increase in pollutant concentrations due to operational traffic.		✓	Changes in traffic are expected to be minimal.
	Increase in pollutant concentrations due to construction traffic.	✓		Changes in traffic are expected to be minimal.
Noise and Vibration	Construction stage noise and vibration effects for both the proposed converter station and cable route.	✓		Proximity of residential receptors and low levels of baseline noise around the proposed converter station.
	Converter station noise.	✓		Low level of baseline noise around the proposed converter station.
	Operational noise along the cable route.		✓	Expected to be negligible.
Landscape and Visual	Effects on landscape character within and beyond 3km of the proposed converter station site during operation and construction.	✓		Changes on the landscape are likely due to the construction works and new built form, lighting and landscaping.
	Effects on visual receptors within 3km of the proposed converter station boundary during construction, operation and decommissioning.	✓		Changes in the visual amenity of visual receptors due to on site demolition, construction and decommissioning as a result of changes to landscape character.
	Effects on visual receptors beyond 3 km of the proposed converter station boundary.		✓	Changes in the visual amenity of visual receptors due to on site demolition, construction and decommissioning as a result of changes to landscape character.

ES DISCIPLINE	POTENTIAL EFFECT	SCOPED IN	SCOPED OUT	REASONS
	Effects on landscape/seascape character and features associated with the landfall during construction, operation and decommissioning.		✓	Whilst temporary effects will be generated associated with the landfall these will be short term and the scale of construction works will be minimal. Works will result in a below ground structure which will house the transition bay. Land will be reinstated following construction.
	Effects on landscape character and features associated with the DC cable route during construction, operation and decommissioning.	✓		Permanent landscape effects will be insignificant along the route apart from the last 2km where the route will cross fields rather than utilise existing roads. Here there may be subject to determination of the preferred option and route option the permanent loss of landscape features which contribute to landscape character and screening.
	Effects on landscape character and features associated with the AC cable route during construction, operation and decommissioning.	✓		Due to the width of the route required for the AC cables there is likely to be a permanent loss in landscape features which contribute to landscape character and screening.
	Effects on visual receptors within 100m buffer on either side of the cable route and landfall beyond 2km of the proposed converter station during construction, decommissioning and operation.		✓	Temporary short term effects will be generated during construction along the route and adjacent to the landfall. The land will be reinstated following the installation of the cables and returned to its previous use.
	Effects on visual receptors within 100m buffer on either side of the cable route up to 2km of the proposed converter station.		✓	Changes in the visual amenity of visual receptors due to land take and loss of vegetation. Extent of vegetation loss associated with hedgerows and hedgerow trees will be dependent on route option selected.
Heritage and Archaeology	Partial or complete loss to buried heritage assets (construction).	✓		Proposed Development will involve ground disturbance through excavation and topsoil removal activities.
	Removal of Historic Hedgerows (construction).	✓		Direct disturbance to Historic Hedgerow.
	Impact on setting of nearby designated heritage assets at the proposed converter station site (construction).	✓		Construction activities may temporarily impact setting of heritage assets.
	Impact on the setting of above ground designated heritage assets at the landfall and throughout the cable route (construction).		✓	Works will comprise only below ground disturbance.
	Permanent impact on the setting of above ground designated heritage assets at the	✓		Presence of permanent above ground structures.

ES DISCIPLINE	POTENTIAL EFFECT	SCOPED IN	SCOPED OUT	REASONS
	proposed converter station (operation).			
	Impact to buried archaeological remains (operation).		✓	No further ground disturbance following completion of the construction stage.
	Impact on the setting of above ground designated heritage assets at the landfall and throughout cable route (operation).		✓	Works will comprise only below ground disturbance.
Ecology	<p>Effects on designated sites for nature conservation, including SPA, SAC, Ramsar, SSSI, LNR, SINC and RVEI:</p> <ul style="list-style-type: none"> • Land-take; • Habitat removal and damage; • Disturbance (visual, noise, lighting); • Pollution (air quality, dust generation, deposition, run-off); • Construction site hazards; • Habitat creation; and • Hydrology and pollution. 	✓		<p>10 European or internationally designated sites are located within 10km of the scheme and 11 nationally designated sites are located within 2km. Due to the presence of Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar/SSSI and Solent and Dorset Coast pSPA the Proposed Development must be screened and assessed, to determine whether significant effects are likely to result.</p> <p>Based on the current design and indicative areas required for construction, it is understood that the following locally designated sites have potential to be affected by the scheme through disturbance, hydrological change, pollution effects or direct land-take:</p> <ul style="list-style-type: none"> • Eastney Beach SINC • Land West of Fort Cumberland SINC • Melville Road Verge SINC and RVEI • Milton Common SINC • Great Salterns Lake SINC • Golf Course North of Burrfields Road SINC • Hilsea Lines SINC • Farlington Avenue SINC and RVEI • Meadow West of Farlington Avenue SINC • London Road Fen SINC • Kings Pond Meadow SINC • Crabdens Copse SINC • Crabdens Row SINC
	<p>Effects on habitats:</p> <ul style="list-style-type: none"> • Land-take; 	✓		72.79ha of woodland listed on the National Inventory of Woodland and Trees and 13 types of Priority Habitat was present within 1km of the scheme

ES DISCIPLINE	POTENTIAL EFFECT	SCOPED IN	SCOPED OUT	REASONS
	<ul style="list-style-type: none"> • Habitat removal and damage; • Disturbance (visual, noise, lighting); • Pollution (air quality, dust generation, deposition, run-off); • Construction site hazards; • Habitat creation; and • Hydrology and pollution. 			
	<p>Effects on protected species:</p> <ul style="list-style-type: none"> • Species-specific effects (direct mortality, injury, disturbance) • Severance and barriers to dispersal 	✓		<p>The following species may occur within the survey area:</p> <ul style="list-style-type: none"> • Bats; • Badger; • Otter; • Water vole; • Dormouse; • Breeding Birds; • Wintering and Passage Birds; • Reptiles; • Great crested newt; and • Invertebrates.
Socio-economics	<p>Generation of direct, indirect and induced employment opportunities during the construction stage.</p>	✓		<p>Due to the anticipated direct job creation and spending / contracts being placed with contractors, there is anticipated to be a positive effect of the Proposed Development in relation to employment opportunities within the economy.</p>
	<p>Changes in local service demand (education and healthcare), accomodation and community facilities due to an increase in population from construction workers.</p>	✓		<p>Due to the specialist nature of the works associated with the Project, there is likely to be an influx of construction workers from outside of the local and regional area. This may cause an increase in the demand on local services, accomodation and community facilities.</p>
	<p>Disruption and changes to amenity value for</p>	✓		<p>Proposed Development and associated activities may</p>

ES DISCIPLINE	POTENTIAL EFFECT	SCOPED IN	SCOPED OUT	REASONS
	users of recreational / open space.			cause disruption and changes in amenity value for users of publicly accessible recreational / open space.
	Generation of direct, indirect and induced employment opportunities during the operational stage.		✓	The additional direct, indirect and induced employment opportunities associated with the Proposed Development are considered to be minimal. As such, effects in relation to employment during operation will not be considered further within the ES.
Water Resources and Flood Risk	Impact on surface water features.	✓		Proposed Development located in proximity to watercourses, land drains and ponds and crosses numerous watercourses.
	Impact on groundwater features.	✓		Proposed Development located within Principle Aquifer and Inner Zone (Zone 1) SPZs.
	Impacts to flooding.	✓		Proposed Development located within and in close proximity to Flood Zone 2 and 3. Also within areas identified to be at risk of surface water flooding.
Ground Conditions	Land contamination.	✓		During construction, land and ground water that was previously contaminated may be encountered.
	Mineral resources.	✓		If contaminated land is found, it may need to be treated or disposed of.
	Sites of geological interest.	✓		Proximity to land that has special geological significance.
Carbon and Climate Change	GHG assessment covering construction, operation and beyond system boundary.	✓		Potential for significant construction emissions as well as potential for significant emissions savings during operation due to transfer of low carbon intensity power.
	GHG assessment of the end of life stage.		✓	Decommissioning timescales and process are distant and uncertain. Materials are expected to be recycled in many cases thereby offering emissions savings for the next product system.
	Climate resilience assessment.	✓		The changing climate may affect the Proposed Development in terms of the construction and operation of the infrastructure its ability to function and the end-users.
Human Health	Desktop Health Impact Assessment	✓		The screening exercise has identified a number of health determinants to be assessed by a rapid desktop HIA.
Soils and Land	Potential loss of best and most versatile	✓		Development will be required on agricultural land.

ES DISCIPLINE	POTENTIAL EFFECT	SCOPED IN	SCOPED OUT	REASONS
Use	agricultural land.			
	Potential loss or damage to soil resources.	✓		Soil resources may be lost or damaged due to construction of the Proposed Development.
	The viability of farm holdings.	✓		The loss of land during and following construction, and the temporary severance of land during construction, may negatively impact local farm holdings.
Electric and Magnetic Fields	Consideration of AC and static electric and magnetic fields.	✓		The Proposed Development uses both AC and DC technologies so both AC and static electric and magnetic fields will be produced.
Waste and Material Resources	Consumption of materials and products and the generation and use of site arisings recovered from the Proposed Development.	✓		The Proposed Development will use materials and produce site arisings.
	The production and disposal of waste to landfill.	✓		Some waste generated from the Proposed Development may need to be disposed of to landfill.
	Lifecycle assessment of materials and arisings and waste.		✓	The resource required to complete a full lifecycle assessment is disproportionate to the benefit it would offer the assessment of significance of effects.
	Materials consumption, site arisings and waste production beyond the first full year of operation.		✓	Associated impacts of operation waste after the first full year are not likely to be significant.

Appendix 2 - Proposed Structure of the Environmental Statement

The structure proposed for the ES is in line with Schedule 4 of the *EIA Regulations* and other relevant good practice guidance. Essentially, the ES will comprise four main parts:

Volume 1 – Environmental Statement

Front End

- 1.0 Introduction
 - 1.1 Description of the Site and Surrounding Area
 - 1.2 Legal Framework for the ES
 - 1.3 Structure of the ES
- 2.0 Approach to the Assessment
 - 2.1 Objectives
 - 2.2 Scope of the ES
 - 2.3 Consultation
 - 2.4 Assessment Criteria
- 3.0 The Proposed Development
 - 3.1 Introduction
 - 3.2 Description of the Proposed Development
- 4.0 Alternatives
 - 4.1 Introduction
 - 4.2 Description of the Proposed Development

Technical Chapters

- 5.0 Traffic and Transport
- 6.0 Air Quality
- 7.0 Noise and Vibration
- 8.0 Landscape and Visual
- 9.0 Heritage and Archaeology
- 10.0 Ecology (with Arboriculture)

- 11.0 Socio-Economics
- 12.0 Water Resources and Flood Risk
- 13.0 Ground Conditions
- 14.0 Carbon and Climate Change
- 15.0 Soils and Land Use
- 16.0 Electric and Magnetic Fields
- 17.0 Waste and Material Resources

Concluding Chapters

- 18.0 Cumulative Effects
- 19.0 Summary of Effect and Mitigation Measures
- 20.0 Summary of Residual Effects

Volume 2 – Technical Appendices and Supporting Information

For example, Phase 1 Habitat Survey, Archaeological Desk-Based Assessment, Heritage Statement

Volume 3 – Non-Technical Summary (NTS)

Appendix 3 - Relevant Legislation and Policy

Relevant policy, legislation and guidance is described below as appropriate.

Air Quality

UK Air Quality Strategy

The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS). The AQS provides a framework for reducing air pollution in the UK with the aim of meeting the requirements of European Union legislation. The AQS also sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems.

Air Quality Regulations

Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 for the purpose of Local Air Quality Management (LAQM).

Environmental Protection Act 1990 - Control of dust and particulates associated with construction

The Environmental Protection Act sets out definitions of statutory nuisance relevant to dust and particles and the requirements and tools for Local Authorities to address nuisance issues.

Environment Act 1995

Under Part IV of the Environment Act 1995, local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives defined in the Regulations. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

National Planning Policy Framework

The Government's overall planning policies for England are described in the National Planning Policy Framework. One of the 12 core planning principles in the NPPF is that planning should 'contribute to conserving and enhancing the natural environment and reducing pollution.' The NPPF details a number of policies relating to air quality.

Noise and Vibration

- The Control of Pollution Act (CoPA) 1974 which was introduced to cover a wide range of environmental pollution including noise. Parts of the Act have been superseded by the Environmental Protection Act 1990 (please see below); and

- The Environmental Protection Act (EPA) 1990 which amongst many other things requires local authorities to issue a noise abatement notice where a noise nuisance is proven.

Noise Policy Statement for England

This long term vision is supported by the following aims:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

To assist in the understanding of the terms “significant adverse” and “adverse”, the NPSE acknowledges that there are two concepts that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO). They are:

- NOEL – No Observed Effect Level - This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- LOAEL – Lowest Observed Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected.

The NPSE introduces a third concept that it describes as a significant observed adverse effect level:

- SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur.

However, the NPSE goes on to state:

“It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”

National Planning Policy Framework

The NPPF replaced the majority of previous Planning Policy Guidance notes and Planning Policy Statements, including PPG24: *Planning and Noise*. At present, no alternative detailed guidance has been provided.

The NPPF does not include any noise assessment methodologies, although it does make the following references to noise in the section entitled ‘*Conserving and Enhancing the Natural Environment*’.

Paragraph 109 states:

“the planning system should contribute to and enhance the natural and local environment by..[a number of points including]..preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability”.

The main reference to noise within the NPPF is at paragraph 123 which is reproduced below:

“123. Planning policies and decisions should aim to:

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

Planning Practice Guidance

On 6th March 2014, the Department for Communities and Local Government (DCLG) launched a Planning Practice Guidance web-based resource. It states that the guidance is to complement the NPPF and provides advice on how to deliver its policies.

The Planning Practice Guidance section on noise includes a table that summarises *“the noise exposure hierarchy, based on the likely average response”* which offers *“examples of outcomes”* relevant to the NOEL, LOAEL and SOAEL effect levels described in the NPSE (see above). These outcomes are in descriptive form.

British Standards and Guidance Documents

The noise and vibration assessment will be undertaken with reference to the following British Standards and guidance:

- British Standard 5228: 2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise and Part 2: Vibration; and
- World Health Organisation’s Guidelines for Community Noise;
- British Standard 4142:2014 Methods for rating and assessing industrial and commercial sound; and
- Design Manual for Roads and Bridges Volume 11, Section 3, Part 7 (HD 213/11) revision 1.

Landscape and Visual

- An Approach to Landscape Character Assessment”, Natural England 2014
- Catherington Conservation Area Study and Character Appraisal, East Hampshire District Council, November 2006

- East Hampshire District Landscape Character Assessment, by Land Use Consultants on behalf of East Hampshire District Council, July 2006
- East Hampshire District Council Local Plan Part 1 Joint Core Strategy, East Hampshire District Council, 2014
- East Hampshire District Council Local Plan: Second Review - Saved Policies East Hampshire District Council, 2006
- European Landscape Convention, Committee of Ministers of the Council of Europe, 2000
- Guidelines for Landscape and Visual Impact Assessment - Third Edition, Landscape Institute and the Institute of Environmental Assessment, Routledge, 2013
- Hampshire County Integrated Character Assessment, Hampshire County Council, 2012
- Hampshire Historic Landscape Characterisation, Oxford Archaeology (South), 2013
- Havant Borough Landscape Character Assessment – Sensitivity Report, Kirkham Landscape Planning, Wessex Archaeology / Countryside and Havant Borough Council, 2007
- Horndean Conservation Area Study and Character Appraisal, East Hampshire District Council, June 2010
- National Character Area Profiles, Natural England (undated)
- National Planning Policy Framework, Department for Communities and Local Government 2012
- National Planning Practice Guidance (NPPG), Department for Communities and Local Government, March 2014
- 'Photography and photomontage in landscape and visual impact assessment' Landscape Institute Advice Note 01/11, 2011
- South Downs National Park: View Characterisation and Analysis, LUC, November 2015
- South Downs Integrated Landscape Character Assessment Updated, by Land Use Consultants on behalf of South Downs National Park, 2011
- South Downs Local Plan: Preferred Options (draft 2015) (Estimated adoption in 2018), South Downs National Park, draft 2015
- South Downs Partnership Management Plan – Shaping the future of your South Downs National park, 2014-2019, South Downs National Park
- Winchester Landscape Character Assessment, Winchester City Council, 2004
- Winchester City Council Local Plan Part 1 Joint Core Strategy, Winchester City Council, 2013
- Winchester City Council Local Plan Local Plan Part 2 - Development Management, Winchester City Council, 2017
- Winchester District Local Plan Review – Saved Policies, Winchester City Council, 2006

Heritage and Archaeology

Legislation, policy and guidance relevant to the archaeology assessment are listed below:

- Ancient Monuments and Archaeological Areas Act 1979
- Planning (Listed Buildings and Conservation Areas) (P(LBCA)) Act 1990;
- Burial Act 1857
- The Hedgerow Regulations 1997
- CfA [Chartered Institute for Archaeologists] Dec 2014a, Standards and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment;

- ClfA [Chartered Institute for Archaeologists] Dec 2014b, Standards and guidance for historic environment desk-based assessment;
- DCLG March 2012, National Planning Policy Framework;
- DCLG March 2014, Conserving and Enhancing the Historic Environment: Planning Practice Guide;
- EH [English Heritage] 2008, Conservation principles, policies and guidance;
- Historic England, 2015 The Setting of Heritage Assets.

Ecology (with Arboriculture)

Ecological Scoping has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in England and is summarised as follows:

- The Conservation of Habitats and Species Regulations 2010 as amended (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Protection of Badgers Act 1992;
- The Hedgerows Regulations 1997;
- The National Planning Policy Framework (NPPF) 2012 (DCLG, 2012);
- The East Hampshire District Council Local Plan ; and
- The Portsmouth Plan (The Portsmouth Core Strategy), 2012.

Socio-Economics

Legislative Framework

There are no legislative requirements in relation to the socio-economics effects of a scheme

Policy

National Policy

National Policy Statement for ELECTRICITY networks infrastructure (en-1)

Within the National Policy Statement (NPS) for National Networks, published in 2013, the Government's vision and strategic objectives for electricity infrastructure includes supporting the economy and reduces adverse impacts.

National Policy Statement for ELECTRICITY networks infrastructure (en-5)

There is no specific guidance relevant to socio-economics within the National Policy Statement EN-5, other than the requirement to ensure sufficient assessment of the proposals in the context of the surrounding environment and the need to minimise adverse effects where possible.

National Planning Policy Framework (NPPF)

The NPPF, published in 2012 has an overarching presumption in favour of sustainable development that should be the basis of every plan and every decision. The NPPF notes at paragraph 7 that there are three dimensions to sustainable development: economic, social and environmental. The role of the planning process is to contribute to building a strong,

responsive and competitive economy and to identify and coordinate development requirements, including the provision of infrastructure.

Paragraph 18 states *'the Government is committed to securing economic growth in order to create jobs and prosperity, building on the country's inherent strengths...'*.

Paragraph 19 states *'the Government is committed to ensuring that the planning system does everything it can to support sustainable economic growth. Planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system'*.

National planning practice guidance (NPPG)

The socio-economic assessment has also been guided by the following sections of the online NPPG:

- Open space, sports and recreation facilities, public rights of way and local green space.

Local Policy

The relevant local planning policy documents for the local authorities within the application boundary are summarised as follows:

- East Hampshire District Council Local Plan Part 1 Joint Core Strategy, East Hampshire District Council, 2014
- East Hampshire District Council Local Plan: Second Review - Saved Policies East Hampshire District Council, 2006
- South Downs Local Plan: Preferred Options (draft 2015) (Estimated adoption in 2018), South Downs National Park, draft 2015
- Winchester Landscape Character Assessment, Winchester City Council, 2004
- Winchester City Council Local Plan Part 1 Joint Core Strategy, Winchester City Council, 2013
- Winchester City Council Local Plan Local Plan Part 2 - Development Management, Winchester City Council, 2017
- Winchester District Local Plan Review – Saved Policies, Winchester City Council, 2006

Water Resources and Flood Risk

European Policy

Water Framework Directive (2000/60/EC)

The overall objective of the Water Framework Directive (WFD) is to bring about the effective co-ordination of water environment policy and regulation across Europe. The main aims of the legislation are to ensure that all surface water and groundwater reaches 'good' status (in terms of ecological and chemical quality and water quantity, as appropriate), promote sustainable water use, reduce pollution and contribute to the mitigation of flood and droughts.

Groundwater Directive (2006/118/EC)

The Groundwater Directive aims to set groundwater quality standards and introduce measures to prevent or limit pollution of groundwater, including those listed with the 'List of Priority Substances'. The directive has been developed in response to the requirements of Article 17 of the WFD, specifically the assessment of chemical status of groundwater and objectives to achieve 'good' status.

National Policy

National Planning Policy Framework (2012)

The NPPF sets out the Government's planning policies for England and provides a framework which allows Local Authorities to produce their own plans that better reflect the specific needs of their communities. Planning Practice Guidance (PPG) has been published and is regularly updated, alongside the NPPF to provide guidance on the implementation of the planning policies, including those relating to flood risk, set out in the NPPF. The NPPF also sets out the requirements for a site specific FRA to be undertaken and states that development should not increase flood risk elsewhere.

Flood and Water Management Act (2010)

The Flood and Water Management Act created the role of the LLFA to take responsibility for leading the co-ordination of local flood risk management in their areas. In accordance with the Flood and Water management Act the Environment Agency is responsible for the management of risks associated with main rivers, the sea and reservoirs. LLFAs are responsible for the management of risks associated with local sources of flooding such as ordinary watercourses, surface water and groundwater. The Act is also guiding the role of the LLFA in the review and approval of surface water management systems, leading to LLFAs reviewing and commenting on significant development in regard to the Non-Statutory Technical Standards for Sustainable Drainage Systems.

Environmental Permitting (England and Wales) Regulations (2010)

Under the Environmental Permitting Regulations it is an offence to cause or knowingly permit a water discharge activity, including the discharge of polluting materials to freshwater, coastal waters, relevant territorial waters or groundwater, unless complying with an exemption or an environmental permit (obtained from the EA). The EA sets conditions which may control volumes and concentrations of particular substances or impose broader controls on the nature of the effluent, taking into account any relevant water quality standards from EC Directives. The Environment Permitting Regulations also manages works that have the potential to affect a watercourse under the jurisdiction of the Environment Agency. Any works in, under or near a main river requires permission from the EA to ensure no detrimental impacts on the watercourse.

Non Statutory Technical Standards for Sustainable Drainage Systems (2015)

The Non-Statutory Technical Standards for Sustainable Drainage Systems set out the core technical standards for SUDS proposed within England. These standards should be used in accordance with the NPPF and Planning Practice Guidance. The standards include

guidance on controlling flood risk within a development boundary and elsewhere, peak flow and runoff volume control, and the structural integrity of SUDS.

Land Drainage Act (1991)

Local Authorities and Internal Drainage Boards have additional duties and powers associated with the management of flood risk under the Land Drainage Act. As Land Drainage Authorities, consent must be given for any permanent or temporary works that could affect the flow within an ordinary watercourse under their jurisdiction in order to ensure that local flood risk is not increased. The Land Drainage Act also sets out the maintenance responsibilities riparian owners have in order to reduce local flood risks.

Local Planning Policy

Havant Borough Local Plan (2011 - 2026)

The Havant Borough Local Plan 2011 – 2026 provides guidance for new development within the council's administrative area up to 2026. In order to achieve the vision set out in the framework, a number of strategic objectives and policies have been adopted. Policy CS15 (Flood and Erosion Risk) sets out to direct development away from areas indicated to be at risk of flooding now or in the future and ensure development does not increase flood risk elsewhere.

Ground Conditions

Legislation

Part 2A of the Environmental Protection Act 1990⁵⁷ provides a statutory definition of “contaminated land” as any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that – (a) significant harm is being caused or there is a significant possibility of such harm being caused; or (b) significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused.

Guidance

In the guidance that accompanies the Environmental Protection Act 1990, there is advice on what constitutes significant harm and what constitutes a significant possibility. The following reports provide further guidance on the risk assessment process, and introduce the Contaminated Land Exposure Assessment (CLEA) model:

- Model Procedures for the Management of Land Contamination: Contaminated Land Report 11 (Defra and the Environment Agency);
- Guidance on the legal definition of contaminated land⁵⁸;
- Human Health Toxicological Assessment of Contaminants in Soil⁵⁹;

⁵⁷ HM Government (1990), Environmental Protection Act. London, The Stationery Office

⁵⁸ Department of Environment, Food and Rural Affairs (Defra) (2008), Guidance on the legal definition of contaminated land, Defra

⁵⁹ Environment Agency(2008), Science Report – SC050021/SR2 - Human Health Toxicological Assessment of Contaminants in Soil, Environment Agency

- Updated Technical Background to the CLEA Model⁶⁰; and
- Guiding Principles on Land Contamination⁶¹.

Carbon and Climate Change

Legislative and policy context

European Union EIA Directive

Directive 2014/52/EU ('the EIA Directive') provides the overarching legislative framework for assessing the significance of impacts and effects from schemes on the environment.

The Directive requires that the EIA shall identify, describe and assess the direct and indirect significant effects of a project on climate (Article 3). It also stipulates that the information to be included within the EIA report should include “the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change” (Annex IV).

UK Climate Change Act

The Climate Change Act (2008) established a legal requirement for an 80% reduction in the GHG emissions of the UK economy by 2050 in comparison to the 1990 baseline. The Act also created the Committee on Climate Change, with responsibility for:

- Setting 5 year Carbon Budgets covering successive periods of emissions reduction to 2050.
- Advising and scrutinising the UK Government’s associated climate change adaptation programmes, and
- Producing a National Adaptation Plan for the UK Government to implement.

Infrastructure Carbon Review

In 2013, the UK government published the Infrastructure Carbon Review, aiming to “release the value of lower carbon solutions and to make carbon reduction part of the DNA of infrastructure in the UK”. Major infrastructure owners, operators and developers were invited to endorse, become signatories and make commitments under the review.

The review provided increased emphasis on ‘capital carbon’ (GHG emissions associated with raw materials, activities and transport for construction, repairs, replacement, refurbishment and de-construction of infrastructure) while acknowledging that ‘operational carbon’ (associated with energy consumption for the operation and use of infrastructure) will continue to dominate overall emission to 2050 and beyond.

The Infrastructure Carbon Review highlighted the need to assess GHG emissions early in the lifecycle of an infrastructure scheme when there is the greatest carbon reduction potential. It also led to the publication of a Publicly Available Specification on infrastructure carbon management; PAS2080:2016.

⁶⁰ Environment Agency (2008), Science Report – SC050021/SR3 - Updated Technical Background to the CLEA Model, Environment Agency

⁶¹ Environment Agency (2010), Guiding Principles on Land Contamination, Environment Agency

National Planning Policy Framework

The NPPF (2012)⁶² sets out the core planning principle of supporting “the transition to a low carbon future in a changing climate...”

Chapter 10: Meeting the Challenge of Climate Change, Flooding and Coastal Change, establishes that Local Planning Authorities should “adopt proactive strategies to mitigate and adapt to climate change” with particular focus on reducing emissions, energy (efficiency and renewables, for example), flood risk and coastal change.

Human Health

National Policy

National Planning Policy Framework

The National Planning Policy Framework was published in March 2012 and is key in ensuring the planning system focusses on delivering sustainable development. The NPPF supports ‘promoting healthy communities’ and its core planning principles require consideration of local strategies for health improvement in both plan-making and decision-taking. In particular the social dimension of sustainable development created a role for the planning system to promote healthy communities. According to the framework, the planning system can play an important role in facilitating social interaction and creating healthy, inclusive communities .

Local Policy

Havant Borough Core Strategy 2011

- CS1 Health and Wellbeing 24
- CS2 Employment 33
- CS3 Skills and Employability 39
- CS6 Regeneration of the Borough 49
- CS7 Community Support and Inclusion 52
- CS8 Community Safety 54
- CS11 Protecting and Enhancing the Special Environment and Heritage of Havant Borough 66
- CS13 Green Infrastructure 72

East Hampshire Local Plan

- Theme 1 – CP1, CP11, HE 18, HE19
- Theme 2 – T4, T7, T9, P6, P7
- Theme 4 – IB2, IB3
- Theme 5 – HC1, HC2, HC3, UI1
- Joint Core Strategy – CP5, CP16, CP17, CP20, CP25, CP27, CP28, CP30, CSWB2, CSWB10

⁶² Department for Communities and Local Government, National Planning Policy Framework (2012)

Portsmouth Local Plan

- Portsmouth Local Plan 2006, Retained Policies – DC4, DC5, DC6, DC12, DC20, DC21
- Portsmouth Local Plan 2012 – PCS12, PCS13, PCS14

Winchester District Local Plan

- Joint Core Strategy 2013 – CP7, CP9, CP15, CP17

Soils and Land Use

- EIA Directive 2014/52/EU
- SI 2017 571 The Town and Country Planning EIA Regulations 2017
- National Planning Policy Framework
 - Paragraph 109 of the NPPF states that ‘the planning system should contribute to and enhance the natural and local environment’ by protecting and enhancing soils.
 - Paragraph 112 advises that when considering applications, local authorities should take into account both the economic and other benefits of the BMV land (i.e. that within Grades 1, 2 and 3a of the Agricultural Land Classification System of England and Wales). Where the significant development of agricultural land is deemed to be necessary, areas of poorer quality land should be used in preference to higher quality land.

Electric and Magnetic Fields

- ICNIRP guidance: “Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)”. Health Physics April 1998, Volume 74, Number 4:494-522.
 - Details the guideline limits for general public exposure to power frequency electric and magnetic fields in the UK.
- Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz), Official Journal of the European Communities, 1999/519/EC.
 - Includes a guideline for general public exposure to static magnetic fields in the UK, aligning with Ref. 6 and comments on electric fields.
- Power Lines: Demonstrating compliance with EMF public exposure guidelines. A Voluntary Code of Practice. Department of Energy and Climate Change March 2012.
- ICNIRP, 1994: “ICNIRP Guidelines on limits of exposure to static magnetic fields”. Health Physics 1994, Volume 66, Number 1:100-106.

Waste and Material Resources

Legislation

The Waste Framework Directive (2008/98/EC) provides the overarching legislative framework for the collection, transport, recovery and disposal of waste in the EU.

The Directive explicitly sets a target for recycling/reuse of 70% for CDE (construction, demolition and excavation) wastes by 2020. This requirement has been implemented at the

national level through the Waste (England and Wales) Regulations 2011 (HM Government, 2012).

The Directive sets out the Waste Hierarchy against which action to reduce the production and disposal of waste shall be taken. The Waste Hierarchy is enshrined in law through the Waste (England and Wales) Regulations 2011.

The following legislative instruments in the UK govern the storage, collection, treatment and disposal of waste:

- The Control of Pollution Act 1974;
- Environmental Protection Act (EPA) 1990;
- Waste Minimisation Act 1998; and
- The Clean Neighbourhoods and Environment Act 2005.
- Hazardous Waste (England and Wales) Regulations 2005;
- The Waste (England and Wales) Regulations 2011; and
- The Controlled Waste (England and Wales) Regulations 2012.

National policy documents

The following national policy documents provide a context and strategic basis for the storage, collection, treatment and disposal of waste in the UK:

- Waste Management Plan for England (2013);
- National Policy Statement for Hazardous Waste (2013);
- National Planning Policy for Waste (2014); and
- National Policy Statement for National Networks (2014).

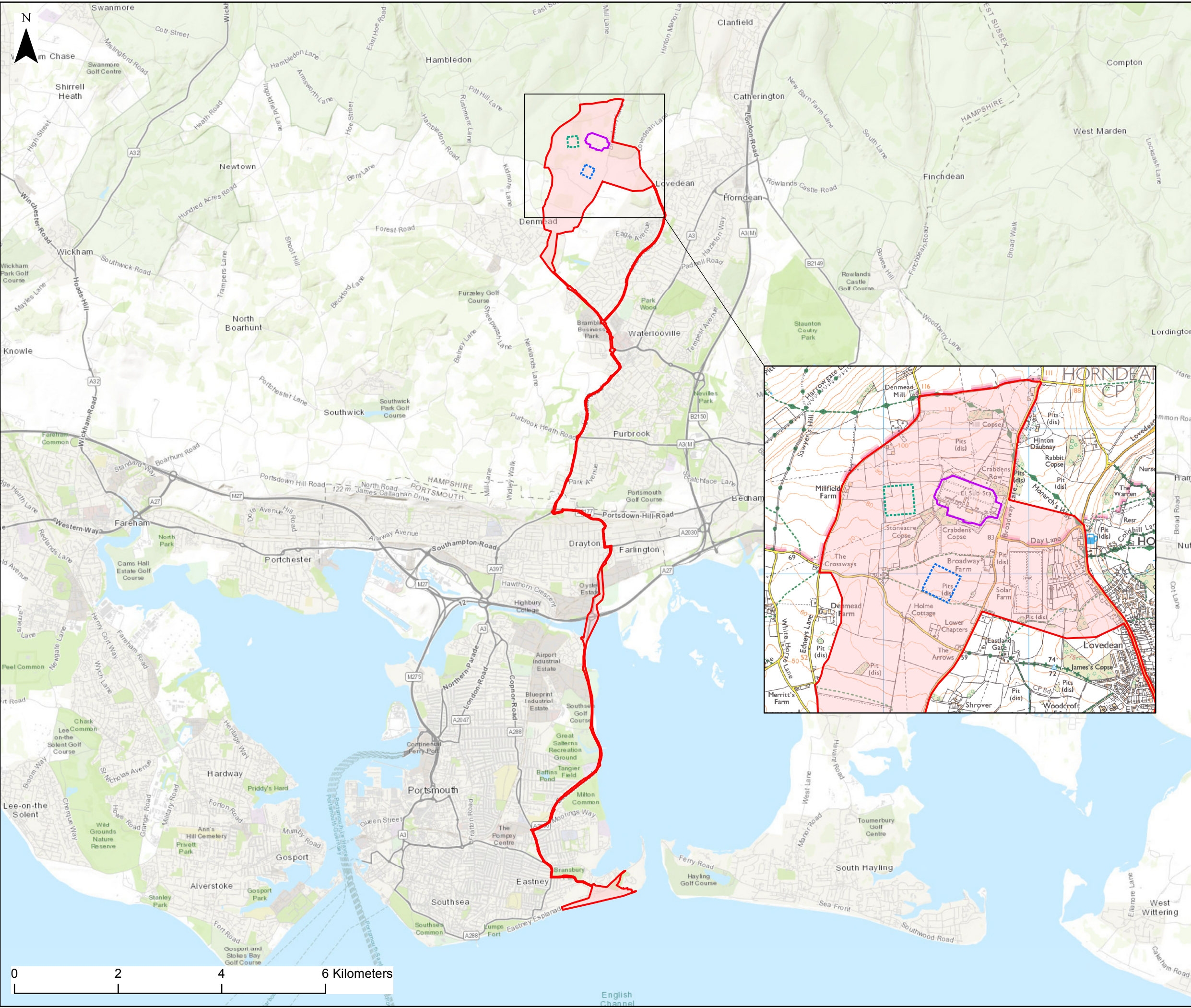
Local policy documents

The following local policy documents (issued by Local Planning Authority jurisdictions that the scheme – wholly, or in part – will be delivered within) have regard to the sustainable management of materials and waste:

- Hampshire Minerals and Waste Plan (2013);
- East Hampshire District Local Plan: Joint Core Strategy (2014);
- Winchester District Local Plan Review (2006);
- Havant Borough Core Strategy (Local Development Framework, 2011); and
- The Portsmouth Plan (2012).

Figure 1.1

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Date Modified: 11/01/2018
Drawn By: AZ



- LEGEND:
- Land Potentially Affected by the Proposed Development
 - Existing Substation Boundary
 - Proposed Converter Station Boundary
 - Option A
 - Option B

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

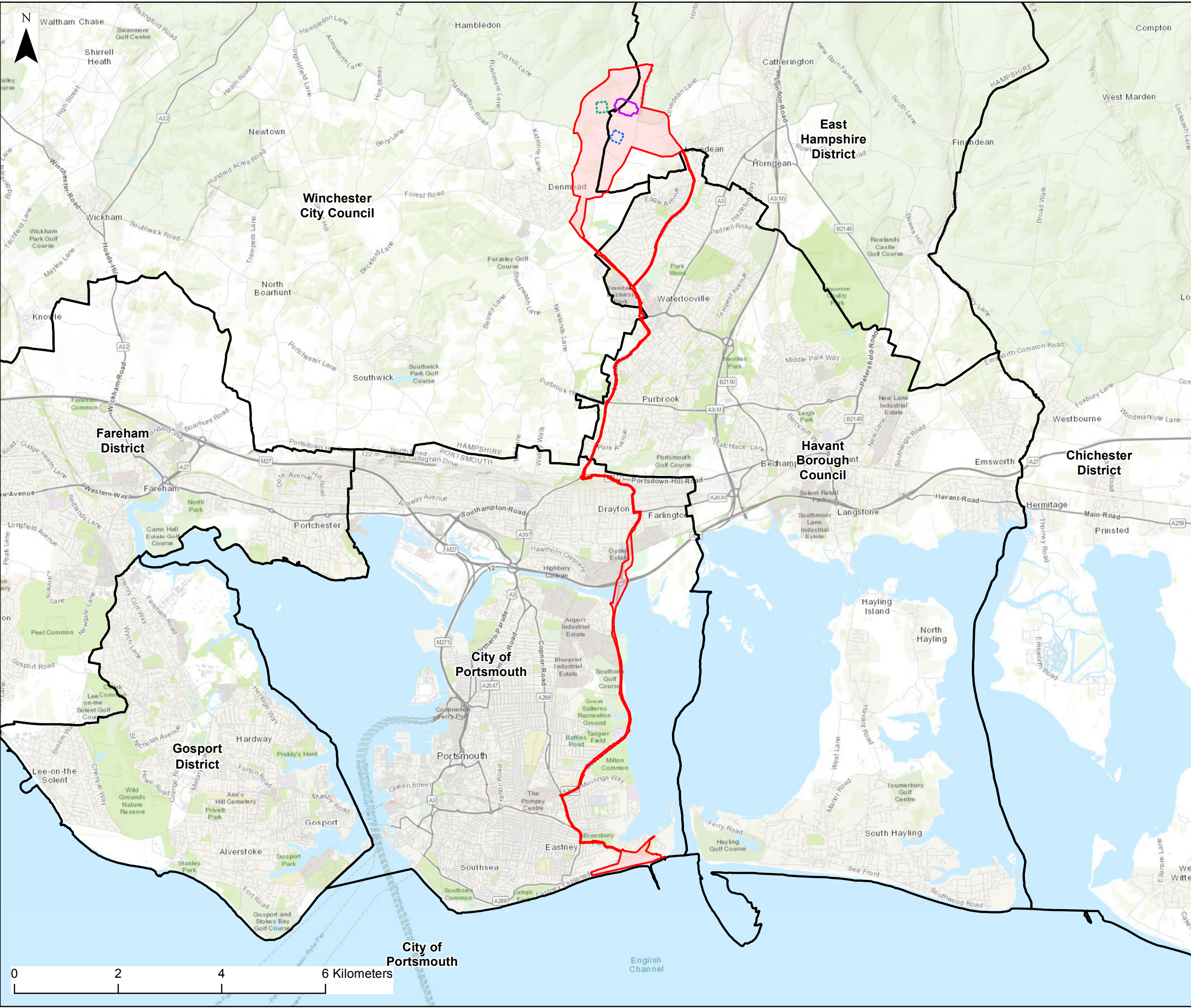


TITLE:
INDICATIVE SITE BOUNDARY

FIGURE No:
1.1

Figure 1.2


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Date Modified: 06/11/2017
Drawn By: AZ



LEGEND:

- Land Potentially Affected by the Proposed Development
- Existing Substation Boundary
- Local Planning Authority Boundary
- Proposed Converter Station Boundary**
 - Option A
 - Option B

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

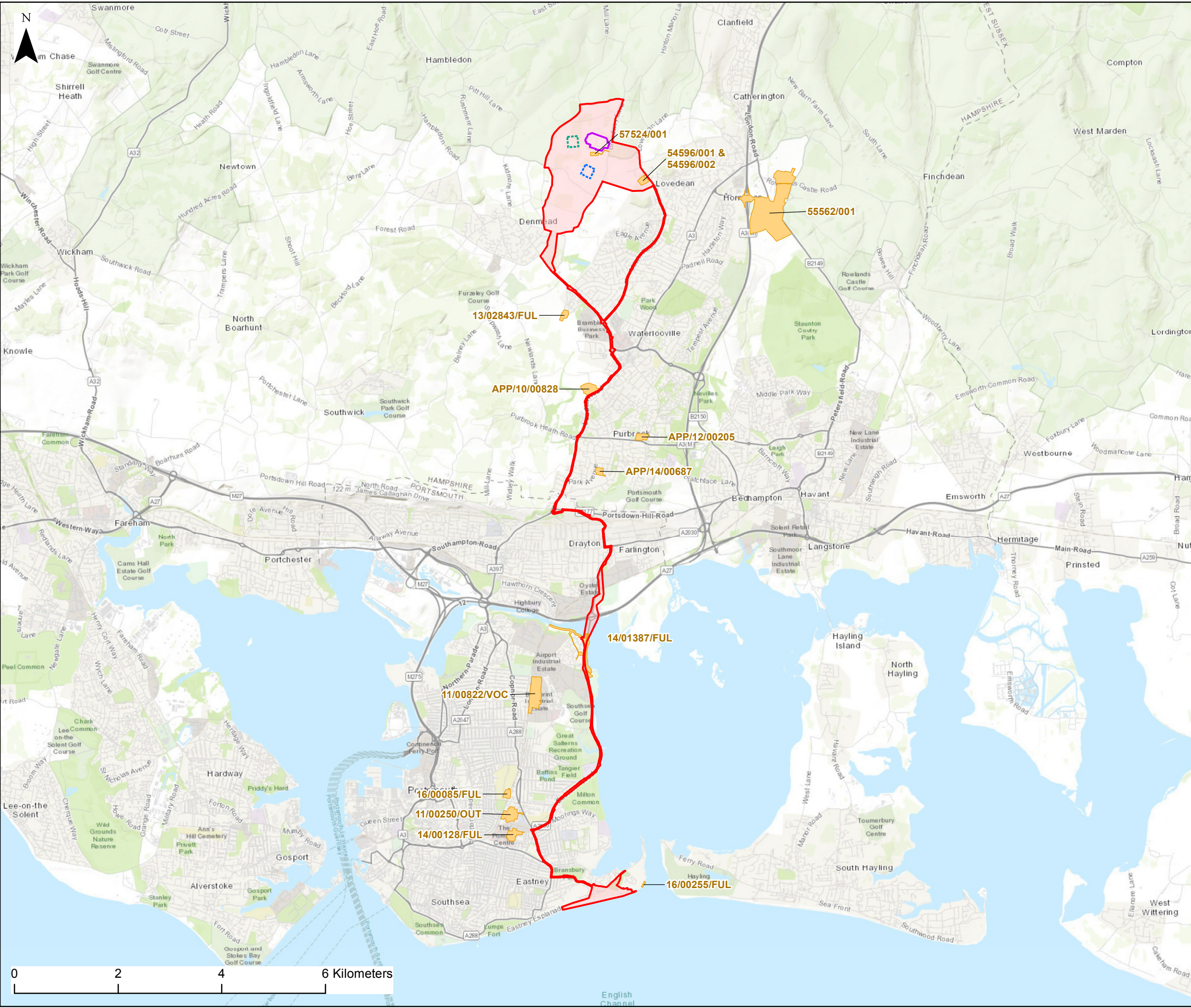


TITLE:
LOCAL AUTHORITY BOUNDARIES

FIGURE No:
1.2

Figure 3.1


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Date Modified: 08/11/2017
Drawn By: AZ



LEGEND:

- Land Potentially Affected by the Proposed Development
- Existing Substation Boundary
- Committed Development
- Proposed Converter Station Boundary
 - Option A
 - Option B

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



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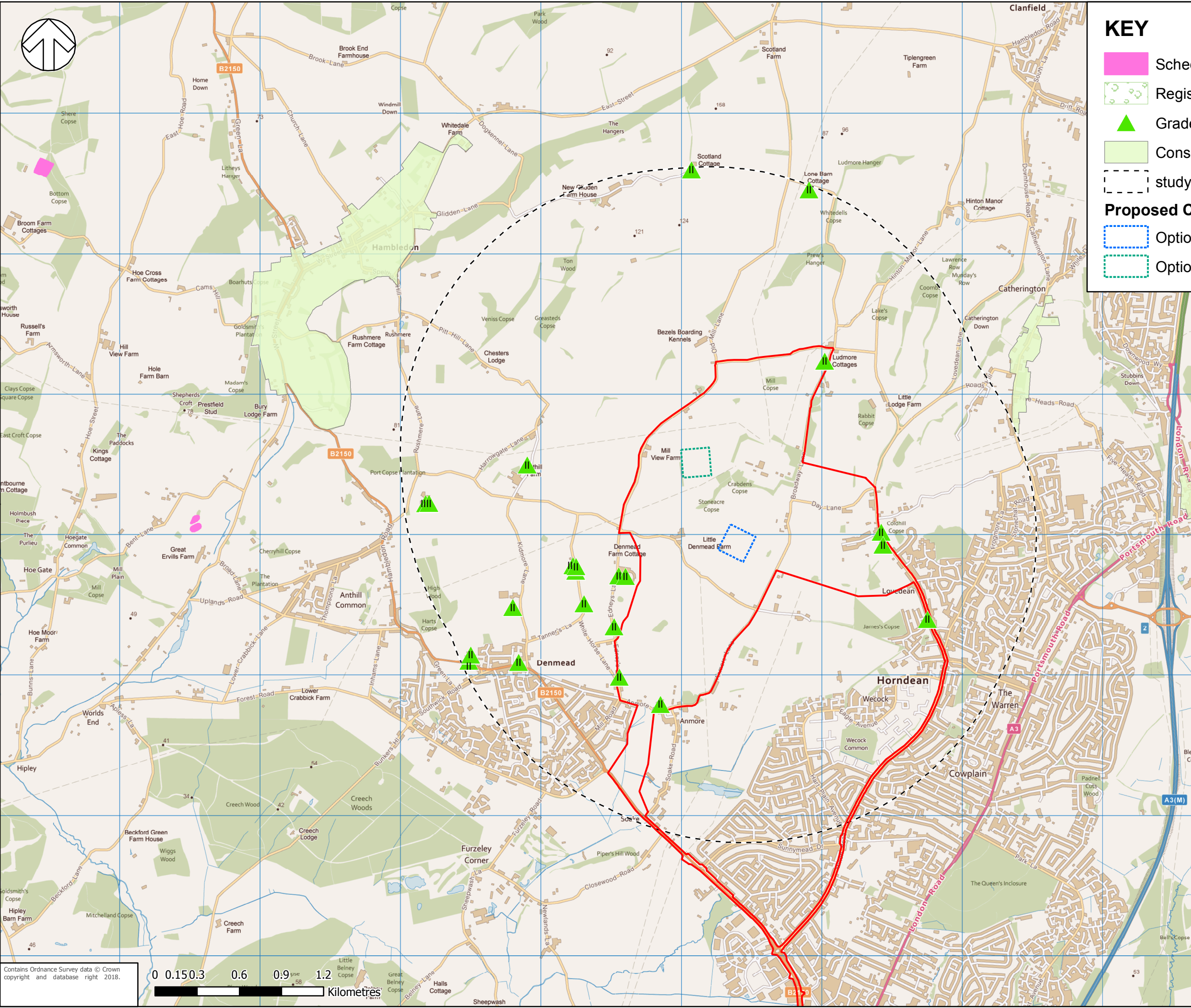
COMMITTED DEVELOPMENTS

FIGURE No:

3.1

Figures 9.1 – 9.4

Date Modified:
Drawn By:
File:



KEY

- Scheduled Monument
- Registered Park and Garden
- Grade II listed buildings
- Conservation Areas
- study area (2km)

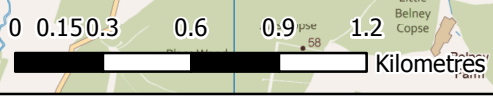
Proposed Converter Station Boundary

- Option 1
- Option 3

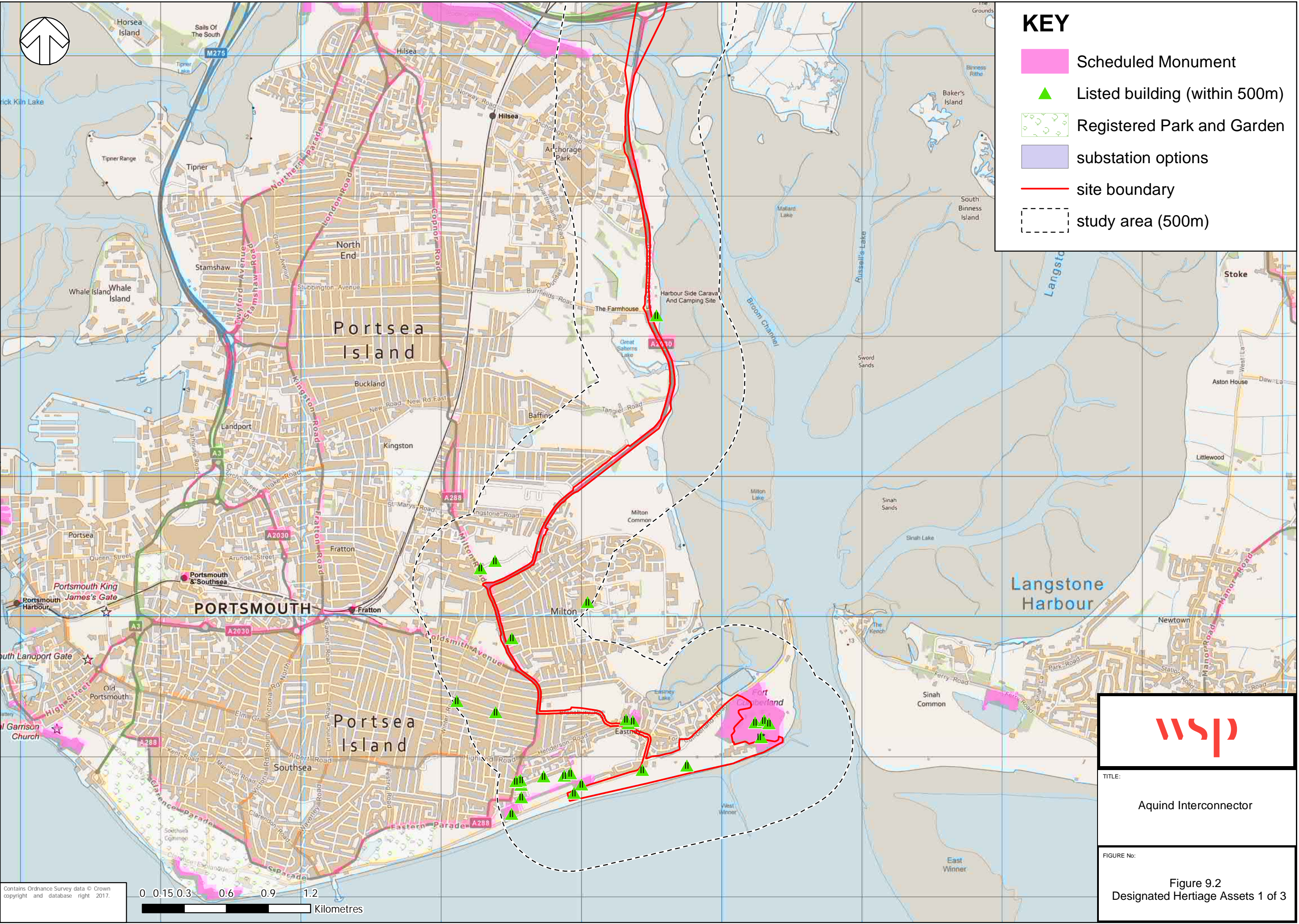
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Aquind Interconnector

FIGURE No:
Figure 9.1
Converter Station Options

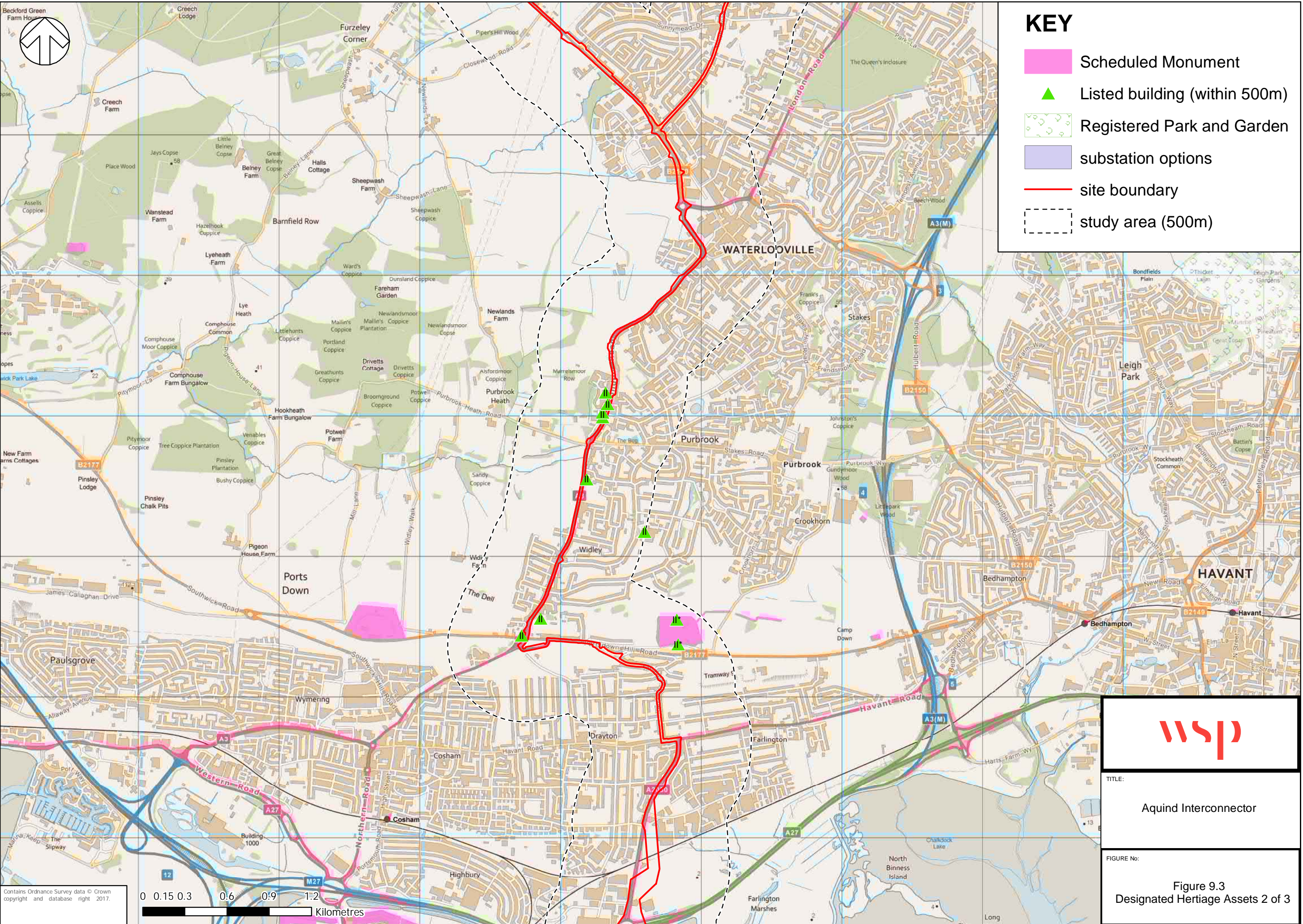
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Drawn By:
File:




Date Modified: Drawn By: File:



KEY

- Scheduled Monument
- Listed building (within 500m)
- Registered Park and Garden
- substation options
- site boundary
- study area (500m)



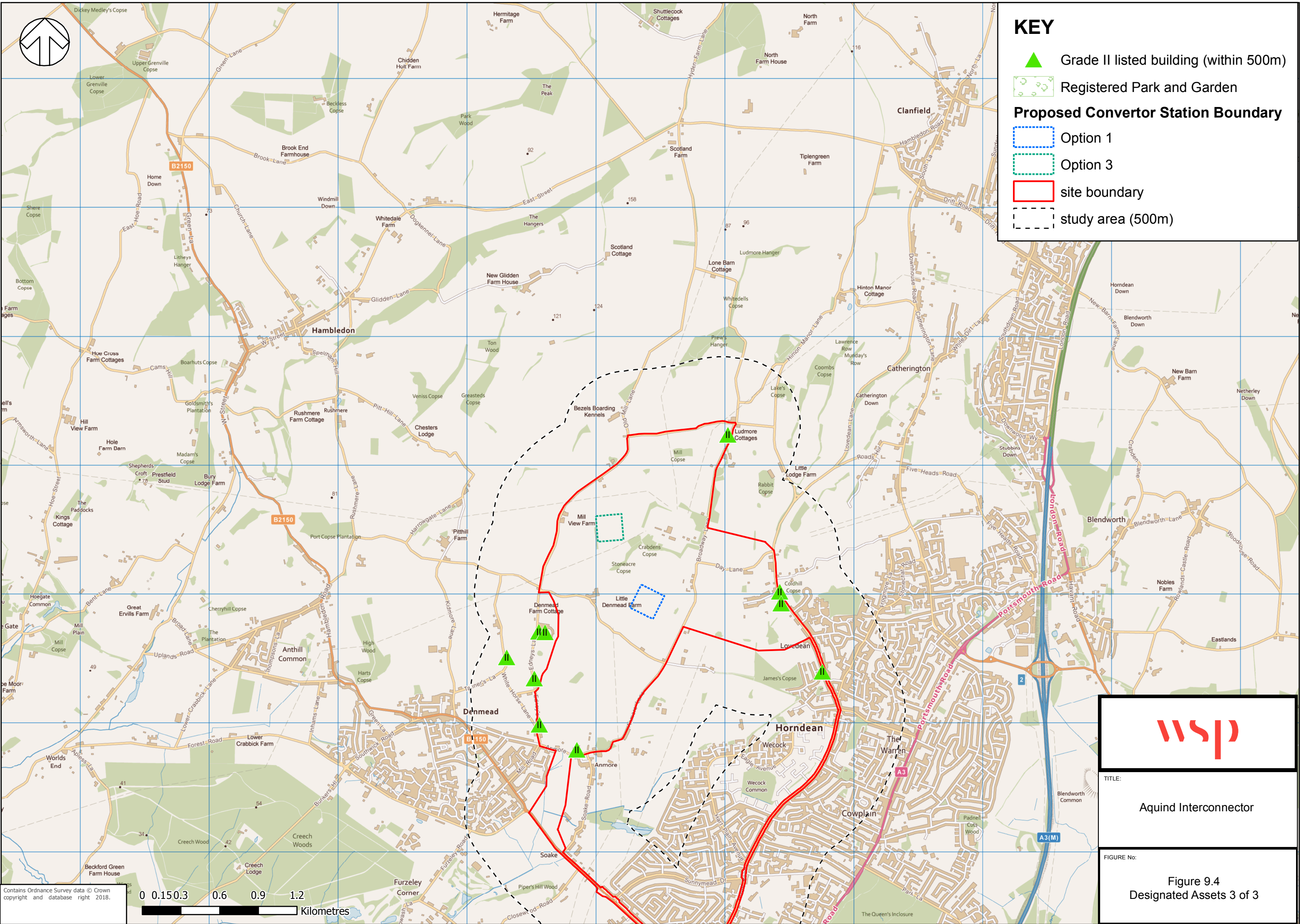
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FIGURE No:
**Figure 9.3
Designated Heritage Assets 2 of 3**

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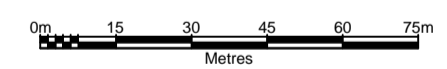


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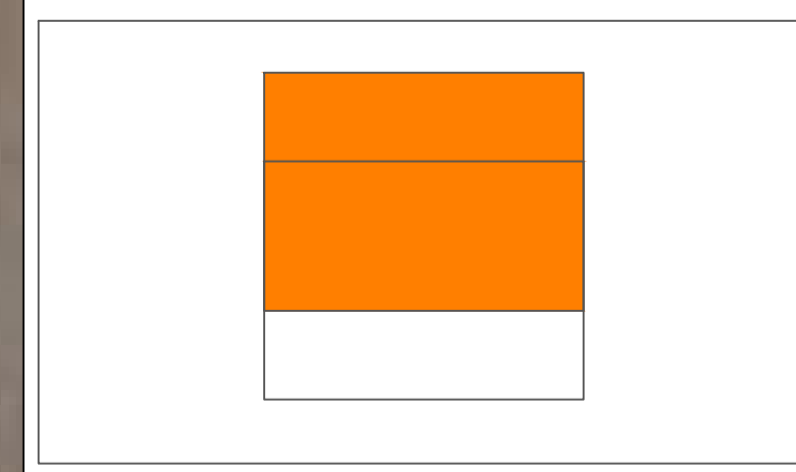
Figure 10.1

KEY

- PREFIX**
- T TREE
- G GROUP
- W WOODLAND
- H HEDGE
- CATEGORY GRADING**
- A CATEGORY
- B CATEGORY
- C CATEGORY
- U CATEGORY
- ATTRIBUTES**
- INDICATIVE ROOT PROTECTION AREA
- INDICATIVE TREE CANOPY
- OTHER ATTRIBUTES**
- ANCIENT SEMI-NATURAL WOODLAND
- SURVEY BOUNDARY
- NO ACCESS DURING SURVEY



SHEET LAYOUT:



INFORMATION ONLY

Rev	Date	Description	By	Chk	App
A	15/08/17	First Draft	CR		

Notes:
 1. To be printed in colour on A1 paper.
 2. All tree positions are approximate and should not be relied upon. If the position of these features is of importance then a topographic survey will be required.

1 Capital Quarter
 Tyndall Street
 Cardiff
 CF10 4BZ
 Tel: 44-(0)29 207 69235

Client: **AQUIND LIMITED**

Site/Project: **AQUIND FRANCE
 UK INTERCONNECTOR
 LOVEDEAN SUBSTATION**

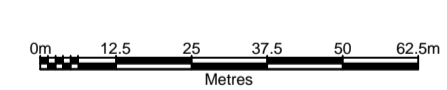
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 CONSTRAINTS PLAN**

Drawn: CR	Checked:
Designed: BK	Approved:
Date: 15/08/2017	Scale: 1:1,500 A1 Sheet: 1 of 2
Project Number: 62100616	Drawing Number: 62100616-TCP-01 Revision: A

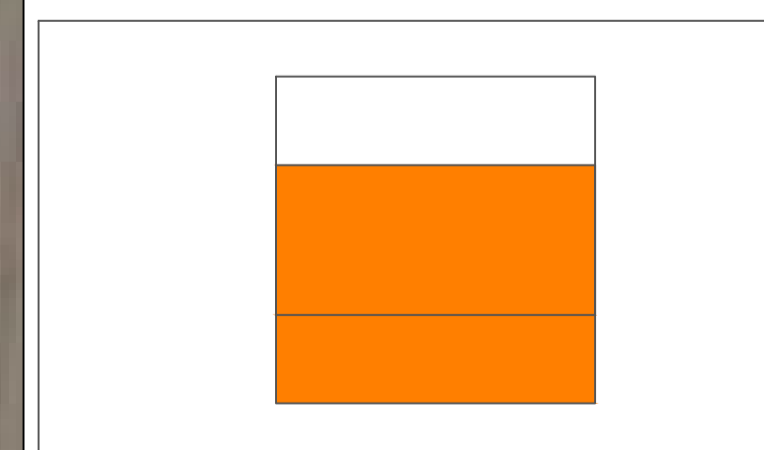


KEY

- PREFIX**
- T TREE
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- CATEGORY GRADING**
- A CATEGORY
- B CATEGORY
- C CATEGORY
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- ▨ ANCIENT SEMI-NATURAL WOODLAND
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Designed: BK	Approved:
Date: 15/08/2017	Scale: 1:1,500
Project Number: 62100616	Drawing Number: 62100616-TCP-01
	Revision: A