AQUIND Limited

AQUIND INTERCONNECTOR

Onshore Outline Construction Environmental Management Plan

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(q)

Document Ref.: 6.9

PINS Ref.: EN020022

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PINS REF.: EN020022

DOCUMENT: 6.9

DATE: 14 NOVEMBER 2019

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DOCUMENT

Document	6.9 Onshore Outline Construction Environmental Management Plan
Revision	001
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Date	23 October 2019
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Date	23 October 2019

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1. INTRODUCTION

1.1. PURPOSE OF THE ONSHORE OUTLINE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

1.1.1.1. This Onshore Outline Construction Environmental Management Plan ('CEMP') has been prepared on behalf of AQUIND Limited ('The Applicant') to support the application for a Development Consent Order ('DCO'). The application for the DCO is made in respect of the UK elements of AQUIND Interconnector Project which will operate between France and the UK.

1.1.1.2. The DCO Application for the UK elements covers the parts of the Project located onshore in the UK ('Onshore Components'); and in the UK Marine area, defined as all of that part of the Project from the Mean High Water Spring ('MHWS') mark in the UK out to the limit of the UK/France Exclusive Economic Zone ('Marine Components'). Together the Onshore Components and the Marine Components comprise the 'Proposed Development', in respect of which the DCO Application is made. Refences to the Order Limits and the Site in this document, and within any of the appendices or plans enclosed within, are only in relation to the Order Limits and the Site, as applicable, to the Onshore Components of the Proposed Development.

1.1.1.3. This Onshore Outline CEMP covers the Onshore Components:

- Works at the existing National Grid Lovedean substation in Hampshire to facilitate the connection of the Project to the Great Britain electrical transmission network, the National Grid;
- Underground High Voltage Alternating Current ('HVAC') Cables, connecting the National Grid Lovedean substation to the proposed Converter Station;
- The construction of a Converter Station comprising a mix of buildings, outdoor electrical equipment and telecommunications equipment and a Works Compound and Laydown Area; Access Road and associated haul roads;
- Up to two Telecommunications Buildings (one for each circuit) are anticipated to be located outside the main Converter Station security fence, so that they can be accessed by third parties;
- Two pairs of underground High Voltage Direct Current ('HVDC') Cables each of which is paired with a smaller diameter fibre optic cables for data transmission, to run from the Converter Station to the Landfall site in Eastney (near Portsmouth); and

- Infrastructure to join the Onshore and Marine HVDC Cables together at the Landfall, and Optical Regeneration Stations ('ORS') (one for each circuit) housed in separate buildings.

1.1.1.4. The purpose of a CEMP is to establish good management practices to ensure that the construction work considers aspects of environmental protection within the context of compliance with local legislation and minimise impacts on both the general public and the environment. The CEMP will set out the overarching principles for environmental management of the onshore construction of the Proposed Development. The Environmental Constraints Plans in Appendix 1 illustrate the relevant environmental constraints for the Proposed Development.

1.1.1.5. Assuming the DCO is granted, the Applicant will appoint a Contractor (or lead contractor for each work package) who will have demonstrated that they are competent in managing the effects of construction on the environment. This is important as it will be the duty of the appointed contractor and its subcontractors to follow the environmental management and mitigation arrangements prescribed in the CEMP, to minimise environmental risks and ensure compliance with any relevant requirements of the DCO.

1.1.1.6. This Onshore Outline CEMP reflects environmental requirements identified to date, which have been identified for action as part of the DCO Application. A CEMP would be produced in accordance with this Onshore Outline CEMP for each of the relevant parts of the Proposed Development. Each CEMP would explain how the activities of contractors and sub-contractors would comply with its requirements, including where necessary the production of subsidiary plans in relation to specific construction matters.

1.1.1.7. Once an appointed contractor is appointed and during construction for the relevant part of the Proposed Development, this Onshore Outline CEMP will be a live document and it will be periodically reviewed and updated by the appointed contractor every six months, or as required, to satisfy all contractual and legislative requirements and ensure environmental risks are managed and mitigated throughout. In particular, it will be updated to take account of the following:

- Changes in detailed design;
- Changes in external factors such as regulations and standards;
- Any unforeseen circumstances as they arise such as new protected species or new archaeological finds and provide a mitigation framework for this;
- Good construction practices and ensure these are adopted and maintained throughout;
- The results of audits and inspections; and
- Learning points from environmental near misses and accidents.

1.1.1.8. This Onshore Outline CEMP is solely for the environmental management associated with the Onshore Components, with a separate CEMP provided for the Marine Components in the Marine Outline CEMP (document reference 6.5).

1.2. LEGAL COMPLIANCE

1.2.1.1. Considerable Environmental legislation applies to the works to be undertaken. The expectation is that all relevant legislation, including requirements for licences, permits and/or consents shall be identified and the appointed contractor will be required to provide details on how compliance is to be achieved, as part of the construction process, through the use of a Project Consents Register.

1.2.1.2. The relevant applicable environmental legislation and regulations will be identified from, but not limited to the list provided in Appendix 2. The list of relevant legislation and its applicability to the Site and the construction works will be reviewed and updated whenever necessary by the appointed contractor.

1.3. STRUCTURE OF THE ONSHORE OUTLINE CEMP

1.3.1.1. This Onshore Outline CEMP is based on established good management practice through British Standards and CIRIA guidance, and includes the following information:

- **Site Information and the Proposed Development:** including site and the surrounding area and a summary of the key environmental receptors associated with the construction of the Proposed Development.
- **Roles and Responsibilities**: An outline of the project roles and responsibilities required as part of the CEMP.
- **General Environmental Requirements**: Requirements for audits and inspections, consents and health and safety, competence, training and awareness, internal and external communication including communication with the client, statutory authorities and other stakeholders, public relations, complaints procedures, method statements and incident response.
- **General Environmental Control Measures**: General methods for managing environmental risks, including mitigation, relevant and current environmental legislation, good practice.
- **Location Specific Environmental Control Measures** – Location specific methods for managing environmental risks, including mitigation, and objectives, targets and commitments outlined in the 2019 Environmental Statement (document reference 6.1).
- **Monitoring:** Framework for monitoring receptors and environmental impacts.

2. SITE INFORMATION AND THE PROPOSED DEVELOPMENT

2.1. SITE AND THE SURROUNDING AREA

2.1.1.1. Order Limits have been defined as the limits within which the Authorised Development may be carried out.

2.1.1.2. The Onshore Components are described in Onshore Cable Corridor Sections. Those sections are broken down further to provide a description of different options under consideration.

2.1.1.3. The current baseline of the Site includes:

- Section 1, the Converter Station Area, is located to the west of the existing National Grid Lovedean Substation, rural area and surrounded by agricultural fields. The section is located within Winchester City Council and East Hampshire District Council.
- Section 2 is a predominantly rural area comprising agricultural land. The section is located wholly within Winchester City Council.
- Section 3 is a predominantly rural area comprising open land, located to the east of the settlement of Denmead and west of the settlement of Anmore with a number of dispersed rural properties. The majority of the area forms part of the Denmead Gap (a planning policy designation to prevent the coalescence of Denmead and Waterlooville), with the area immediately south of Anmore Road comprising Kings Pond Meadow Site of Importance for Nature Conservation ('SINC'), with the land further south comprising open land known as Denmead Meadows. The section is located wholly within Winchester City Council.
- Section 5 is located within the urban areas of Drayton and Farlington, suburbs of Portsmouth, and encompasses the highway of Farlington Road, Evelegh Road (south of Solent Infant School), Havant Road, the area of open land known as Scoutlands (between Evelegh Road and Havant Road), and the northernmost section of Eastern Road. The section is located wholly within Portsmouth City Council.
- Section 6 is located within the urban areas Portsmouth, and includes the A2030 Eastern Road and the western half of Zetland Field, and western edge of the Sainsburys Car Park to the north of the railway line. The section is located wholly within Portsmouth City Council.

- Section 7 is located within the urban areas Portsmouth, and includes a large area of Farlington Playing Fields on the mainland. The Onshore Cable Corridor then extends south-westerly across Langstone Harbour (a SSSI, SPA, SAC and Ramsar site) to the yard south of Kendalls Wharf before extending further south splitting around Baffins Rovers football ground re-joining at the northern edge of the southern football pitch. The section is located wholly within Portsmouth City Council.
- Section 8 within the urban area of Portsmouth comprises the A2030 Eastern Road running south with Great Salterns Golf Course to the west and Langstone Harbour to the east towards the northern edge of Milton Common. The Corridor then takes multiple routes across Milton Common, a designated SINC and public open space to Moorings Way encompassing the southern edge of Milton Common to the junction with Furze Lane. The section is located wholly within Portsmouth City Council.
- Section 9 continues south around the built edges of the University of Portsmouth Langstone Campus to Locksway Road and the Thatched House Public House (incorporating the western edge of the Milton Locks Conservation Area and the full extent of Milton Locks SINC). The Onshore Cable Corridor then continues southwest encompassing the south-eastern area of Milton Allotments to the Kingsley Road open space, and onwards to Bransbury Park routing south to Henderson Road in Eastney. The section is located wholly within Portsmouth City Council.
- Section 10 runs south-westerly along Fort Cumberland Road to the Fort Cumberland Road Car Park, adjacent to the Land West of Fort Cumberland SINC (further east lies Fort Cumberland SINC and Scheduled Ancient Monument). From the Car Park the route runs south to the Marine Section of the Cable Corridor and incorporates a section of Eastney Beach, a designated SINC. The section is located wholly within Portsmouth City Council. The current environmental conditions are described in Chapter 3 (Description of the Proposed Development) of the Environmental Statement ('ES') Volume 1 (document reference 6.1.3). For further details of the baseline description, please see Chapters 6 to 28 of the ES Volume 1 (document references 6.1.6 - 6.1.28).

2.2. SUMMARY OF KEY ENVIRONMENTAL RECEPTORS

2.2.1.1. A summary of the key environmental receptors for the project are contained within Table 2.1 below, and are shown in Appendix 1 Figure 2.

Table 2.1 – Key Environmental Receptors during Construction

Topic	Key Environmental Receptors
Landscape and Visual Amenity	**Converter Station** • Landscape character, associated landscape features and the setting of the South Downs National Park; and • Visual receptors: residents, recreational and transport within 8 km study area. **Onshore Cable Route** • Landscape character and associated features; and • Visual receptors): residents, recreational, transport, commercial/ retail/ industrial/ education/ church/ religious facilities and public house facilities within the 120 m buffer on either side of the Onshore Cable Route. **Landfall** • Landscape character and associated features of the Landfall; and • Visual amenity of surrounding visual receptors, including from residential properties and recreational users within 300 m study area of the Landfall.
Onshore Ecology	• Chichester and Langstone Harbour SPA; Wintering Intertidal Birds; • Crabdens Copse and Crabdens Row SINC; • Stoneacre Copse Ancient Woodland; • Kings Pond Meadow SINC; • Denmead Meadows; • Milton Common SINC; • Broadleaved trees; • Species-rich hedgerows with/without trees; • Species-poor hedgerows with/without trees; • Semi-improved negligible and calcareous grassland; • Semi-improved negligible and calcareous grassland; • Badgers; • Bats; and • Reptiles.
Soils and Agricultural Land Use	• Agricultural land, including that classed as best and most versatile ('BMV') defined as land classified as Grades 1,2, and 3a of the Agricultural Land Classification ('ALC') system associated with the Converter Station Area and Onshore Cable Corridor Sections 1, 2, 3 and 4;

Topic	Key Environmental Receptors
	• Farmable land area and farming businesses associated with the Converter Station Area and Onshore Cable Corridor Sections 1, 2, 3 and 4; and • Soil resources associated with non-agricultural land within Sections 6, 7 and 9.
Ground Conditions	• Geology (Mineral Safeguarding Area ('MSAs')); • Human Health (construction and maintenance workers and adjacent land users); • Controlled Waters (Principal, Secondary A and Secondary Undifferentiated Aquifers); and • Below Ground Services (potable water supply pipes and buried services).
Groundwater	• Head Aquifer; • Chalk Aquifer; • Water Users; • Lambeth Group Aquifer; • Portsdown Chalk Formation; • Spetisbury Chalk Member; • Tarrant Chalk Member; • Newhaven Chalk Formation; • Bognor Sand Member; • Wittering Formation; • Lambeth Group; • Head Deposits; • Undifferentiated Chalk; • River Terrace Deposits; • Raised Marine Deposits; • Beach and Tidal Flats Deposits; • Portsmouth Sand Member; • Tidal Flat Deposits; and • Storm Beach Deposits.
Surface Water Resources and Flood Risk	• Surface Water Drainage Patterns; • Public Foul Sewer Networks; • Public Water Supply Network; • Surface Waterbodies; • Surface water drainage patterns; • Public Surface Water and Combined Wastewater Networks; • Surface waterbodies flood plains; • Construction Workers; and

Topic	Key Environmental Receptors
	• Residents, users and associated infrastructure of the surrounding area.
Heritage and Archaeology	• Prehistoric activity in the form of isolated pits and enclosure ditches with possibility for burials; • Roman settlement activity; • Early Medieval activity; • Cropmark evidence of a later medieval field systems visible as cropmarks or ridge and furrow cultivation; • Prehistoric activity; • Roman activity; • Roman settlement activity and remains of Roman road; • Early medieval burials; • Palaeoenvironmental remains (Raised Marine Deposits); • Roman remains; • Prehistoric activity relating to exploitation of intertidal resources; and • Below ground remains associated with the early 19th century Portsmouth and Arundel Canal.
Traffic and Transport	• Highway network impacted by the Converter Station Construction Traffic; • Highway network impacted by the Onshore Cable Corridor; • Highway Network impacted by Traffic Redistribution; • Local Highway Network (Hampshire County Council ('HCC')); • Local Highway Network (Portsmouth City County ('PCC')); • Public Transport Services; and • Pedestrians and Cyclists.
Air Quality	• Human Health receptors up to 250 m from the Onshore Cable Corridor; • Emissions as a result of site construction activities and on-road construction vehicles and plant; • Emissions from on-road construction vehicles; • Emissions from diverted traffic; • Emissions from local power generation for Horizontal Directional Drilling ('HDD') and Fibre Optic Cable ('FOC') laying and pulling; and • Ecological Receptors.
Noise and Vibration	**Converter Station Area** • The Haven and Old Mill Cottage; • Hillcrest;

Topic	Key Environmental Receptors
	• Millfield Farm; • Kimberley House; • Little Denmead Farm; • Holme and Highfield Cottages; • Lower Chapters; • The Arrows; • Broadways; • Broadway Farm House; • Broadway Farm Cottages; • Hinton Daubnay; • Ludmore Cottages; • Old Mill House and The Shieling; and • The Ranch. **Onshore Cable Corridor Sections 2 - 10** • Residential properties and other sensitive receptors (e.g. schools, hospitals etc).
Socio-economics	• Local residents and commercial businesses; • Community facilities; and • Recreation, leisure facilities and open space.
Human Health	• Population within Winchester, East Hampshire, Havant and Portsmouth; • Residents, users of community facilities and greenspace within the population of Winchester, East Hampshire, Havant and Portsmouth; and • Site users and adjacent site users within Winchester, East Hampshire, Havant and Portsmouth.
Waste and Material Resources	• Primary materials; and • Landfill capacity.
Carbon and Climate Change	• Materials; • Plant and equipment; • Workforce; • Site compound; and • Traffic.

2.3. TIMING OF ACTIVITIES

2.3.1. WORKING HOURS

2.3.1.1. The description of the assumed programme for the construction of the Proposed Development is based on the anticipated working hours in Table 2.2 with construction being commenced in 2021 and the commissioning of the Proposed Development estimated in 2024.

Table 2.2 – Onshore anticipated working hours

Activity	Anticipated working hours per day	Anticipated working days per week
Converter Station Area Construction	10 hour shifts, 08:00 – 18:00	6 days*
Marine Cable Installation	24 hour shifts	7 days
Onshore Cable Installation ***(including HDD-2, HDD-5 and HDD-6)***	10 hour shifts, 07:00 – 17:00	6 days*
Landfall Installation ***(including HDD-1, TJB and ORS)***	12 hour shifts	7 days
HDD-3 and HDD-4 Installation	12 to 24 hour shifts	7 days

**Day 6 is Saturday working which is typically a 5-hour shift 08:00 to 13:00.*

2.3.1.2. No working hours within this table preclude:

(a) start-up and shut down activities up to an hour either side of the core working hours; and

(b) the receipt of oversize deliveries to the site, the arrival and departure of personnel to and from the site, on-site meetings or briefings, and the use of welfare facilities and non-intrusive activities.

2.3.1.3. The following Onshore Cable Installation operations may take place outside the working hours detailed above, subject to agreement with the Local Planning Authority ('LPA'):

Trenched Areas

- Section 4 – a 90 m section of the A3 London Road in Purbrook near Stakes Road:
  - 07:00 to 22:00 hours, Saturday and Sunday, for 4 weekends (may not be continuous).
- Section 5 – Havant Road near Drayton between Farlington Avenue and Eastern Road:

- Up to 24 hour working, with the noisiest activities (road cutting/breaking and re-surfacing) avoided during hours of darkness for one weekend; or
- 07:00 to 22:00 hours, for up to four weekends.

- Section 6 – Fitzherbert Road and Sainsbury's Car Park:
  - Night Works, with the noisiest activities (road cutting/breaking and re-surfacing) will be avoided during hours of darkness.
- Section 8 – Eastern Road between Airport Service Road and north of Milton Common:
  - Up to 24 hour working, seven days per week for approximately 33 days. Noisiest activities (road cutting/breaking and re-surfacing) will be avoided outside the Harbourside Caravan Park during the hours of darkness.

Trenchless Areas

2.3.1.4. It's anticipated that the following areas of the Onshore Cable Installation may be subject to 24 hour working as detailed in the table above:

- Section 7 Langstone Harbour (HDD):
  - Kendall's Wharf and Farlington Playing Fields (HDD-3).
- Section 6/7 Farlington Railway Crossing (Trenchless):
  - Farlington Playing Fields and southern extent of Sainsbury's car park (HDD-4).

2.3.2. PROGRAMME

2.3.2.1. Table 2.3 below outlines the indicative programme for the construction works associated with the UK Onshore Components of the Proposed Development.

2.3.2.2. Environmental and wildlife constraints have also been taken in to consideration and will be built into the phasing of enabling and construction works for the Converter Station Area and Onshore Cable Route – see Sections 5 and 6 for further detail.

Table 2.3 – Indicative Onshore Construction Programme

Activity	Indicative Programme
Converter Station Construction	Q3 2021 – Q1 2024
Onshore HVDC Route Construction/ Cable Installation	Q3 2021 – Q4 2023
HDD and Landfall Construction (Onshore)	Q3 2021 – Q4 2023
Converter Station Commissioning	Q4 2023 – Q2 2024

2.3.2.3. Public activities and events that are planned in proximity to the Converter Station site and Onshore Cable Route, including but not limited to the following;

- School term time (as required);
- Football season;
- Coastal Waterside Marathon;
- Cowes Week;
- Great South Run;
- South Central Festival; and
- Victorious Festival.

2.3.2.4. These will be taken into consideration by the appointed contractor during the phasing of the of construction works for the Proposed Development.

3. ROLES AND RESPONSIBILITIES

3.1.1.1. Personnel with defined environmental responsibilities are detailed in Table 3.1 below.

3.1.1.2. Each assigned responsible individual will sign to confirm that they understand and accept their designated duties and responsibilities. A signed copy of the CEMP will be retained and made available on request. All personnel on the Project will sign a project induction which will confirm the acceptance of their environmental/sustainability responsibilities.

Table 3.1 – Roles and Responsibilities

Role	Individual	Responsibilities
Project Manager/ Director	TBC	• Overall environmental management of the Proposed Development, ensuring that all works are carried out in accordance with the CEMP.
Environmental Advisor/Manager	TBC	• Work with programme planners and project managers to ensure consents are embedded within the programme. • Monitor submission of consent applications and ensure their timely delivery. • Provide input to consultation with consent granting bodies, commitment holders and other third parties. • Co-ordinate and manage all required scheduled consents and property notifications. • Ensure environmental consents are obtained in line with the programme. • Maintain and update the consents register in line with requirements and ensure review of individual deliverables by project specialists. • Monitor and report progress on consents and commitments. • Monitoring construction works including the sub-contractors for compliance against Environmental Risk Assessment and method statement control measures. • Co-ordination of all environmental documentation. • Monitoring environmental training, consultation and implementation of sub-contractor procedures.

Role	Individual	Responsibilities
		• Attending site Health and Safety Executive ('HSE') committee meetings. • Monitoring of all site environmental incidents and ensuring they are reported and investigated. • Undertaking site inspections. • Accompanying HSE Managers and Environment Agency ('EA') inspections. • Compliance with duty of care, the Site Waste Management Plan ('SWMP') or any permits and/or exemptions. • Monitoring and measurement of waste. • Communicate sustainability good practice, innovation and targets to the project team and supply chain. • Keep a record of key performance indicators ('KPIs'). • Act as the main point of contact on environmental matters relating to the Proposed Development.
Environmental Clerk of Works	TBC	• Support the Environmental Manager in delivering the environmental component of the Proposed Development. • Monitor construction activities and performance to ensure control measures are effective. • Maintain full records of the progress of the Environmental Works. • Implement an auditable environment record filing system. • Maintain regular contact and liaison with the Environmental Specialists. • Carry out further monitoring as required by the CEMP.
Ecological Clerk of Works	TBC	• Monitoring and management of the ecological-related control measures. • Pre-construction ecological checks for habitats and species. • Implement and maintain exclusion zones. • Oversee provision of ecological mitigation measures.

Role	Individual	Responsibilities
		• Provide ecological information for site inductions, tool-box talks and meetings.
Public Relations Officer	TBC	• To track complaints from members of the public and respond within reasonable time frames. • To liaise with members of the public regarding issues such as any specific anticipated nuisance.
Engineering Manager	TBC	• Raise innovation at team meetings. • Capture good ideas/innovations/lessons learnt. • Track progress of improvements and support if needed. • Grow the culture of innovation by effective means of communication e.g. presentations, site visits, engagement with our supply chain. • Ensure environmental issues and constraints are included in individual designs, in accordance with environmental design procedures.
Planning Manager	TBC	• Plan works to avoid sensitive times of year. • Plan works to avoid working unsociable hours. • Plan into the project consents/surveys required and the time scales in which they take to obtain.
Construction Manager	TBC	• Advising appointed contractor representative on the implementation of the EMS. • Monitoring construction works including the sub-contractors for compliance against Environmental Risk Assessment and any method statement control measures. • Monitoring environmental training, consultation and implementation of sub-contractor procedures. • Accompanying site Environment Inspections where required and any environmental authority inspections. • Attending Environmental co-ordination meetings.
Works Supervisors/Site Manager	Various	• Ensuring that all site work is carried out in accordance with method statements, task briefings and activity briefings.

Role	Individual	Responsibilities
		• Ensure that staff under their supervision is aware of their environmental responsibilities. • Ensure key risks are identified and brief operatives on environmental topics. • Carry out site inspections to identify any environmental issues.
General Operatives	N/A	• Ensuring environmental mitigation measures are carried out during the course of their duties, in line with work package plans, task briefings and activity briefings. • Working considerately with a good working ethic in order to minimise adverse environmental impacts and follow all site rules communicated during briefings and project training sessions. • Informing their line management of any environmental issues they have on site, so that these can be communicated to the project management team for further investigation. • Attending the project induction prior to commencing work where details of the site environmental rules will be provided.
Waste Champion	TBC	• The effective communication of the Site Waste Management Plan ('SWMP') to their operatives and ensures enforcement of the SWMP at an operational level e.g. identifying areas for improvement where segregation is not being followed. • For the delivery of relevant toolbox talks where necessary.

4. GENERAL ENVIRONMENTAL REQUIREMENTS

4.1. REQUIREMENTS AND CONSENTS

4.1.1.1. The Proposed Development shall be carried out within the requirements (but not limited to) of the relevant legislation (see Appendix 2).

4.1.2. AUDITS AND INSPECTIONS

4.1.2.1. Regular inspections of the Site shall occur to ensure compliance with the CEMP, check compliance with the legal and contractual requirements and to minimise the risk of damage to the environment. All environmental incidents shall be reported to the Environmental Manager.

4.1.2.2. The Environmental Manager shall carry out weekly inspections and complete an assessment of the works' environmental performance measured against KPIs, environmental standards, relevant legislation and the CEMP objectives.

4.1.2.3. Document control shall be in accordance with a Quality Management System and copies of all environmental audit reports, consents and licences shall be maintained by the appointed contractor's Environmental Manager. They will be held on Site for review at any time.

4.1.2.4. The appointed contractor shall be responsible for investigating and addressing any non-conformances raised by the inspection within an agreed time frame and ensuring that corrective and preventative actions have been fully implemented and closed out.

4.1.2.5. The appointed contractor and the Client representative shall be responsible for updating and reviewing the CEMP on a regular basis to ensure continual improvements.

4.1.3. CONSENTS AND HEALTH AND SAFETY

4.1.3.1. All staff employed must have regard to the Health and Safety at Work Act 1974 – that all persons employed will take reasonable care for the health and safety of themselves and other persons who may be affected by their acts or omissions.

Electricity safety

4.1.3.2. National Grid Electricity Safety Rules are mandatory. All staff who works on or near to the transmission system at the Lovedean Substation must understand and be familiar with the detail of the safety rules and appropriate supporting documents (National Grid UK Electricity Transmission Plc , 2018) (Fifth Edition).

4.1.3.3. Works at Section 1 Lovedean (Converter Station Area) will be undertaken in line with the overarching legal framework Electricity Safety, Quality and Continuity Regulations (Health and Safety Executive, 2002), and the *Third-party guidance for working near National Grid Electricity Transmission equipmen*t (National Grid, 2016).

4.1.3.4. Before works are undertaken on site, all relevant site staff will be made aware of and made sure they understand the HSE Guidance Note "*Avoiding danger from underground services*" (HSE, 2014).

4.1.3.5. Works will be planned to avoid underground services. Where this is not possible, plans will be developed to minimise the risk of damage to those services in the work area.

4.1.3.6. When carrying out excavations in the vicinity of electricity assets, the safe system of work will be employed:

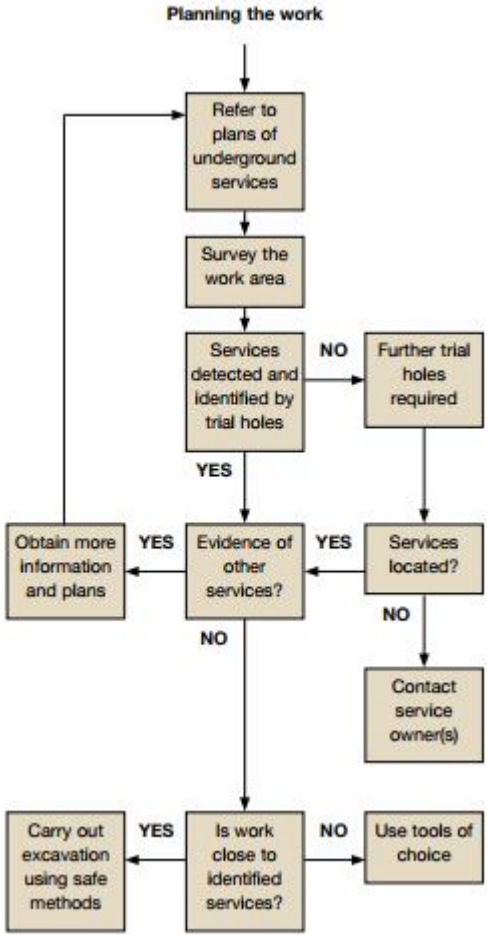

Plate 4.1 – A safe system of work (HSE, 2014)

4.1.3.7. Minimum clearances from the Overhead Line Clearance Technical Specification 43-8 will be adhered to onsite in relation to overhead lines (Energy Networks Association, 2004) (as amended). Plant, machinery, equipment, buildings or scaffolding will not encroach within the minimum clearance specified (dependent on-site conditions) of any high voltage conductors when those conductors are under their worse conditions of maximum "sag" and "swing" and overhead line profile (maximum "sag" and "swing") drawings should be obtained.

Electric and Magnetic Fields

4.1.3.8. The Onshore Cable Route alignment and design considered the advice provided by the National Radiological Protection Board on recommending the adoption in the UK of public exposure guidelines published in 1998 by the International Commission on Non-Ionizing Radiation Protection (International Commission on Non-Ionizing Radiation Protection, 1998) in terms of the 1999 EU Recommendation (The Council of the European Union, 1999) when the time of exposure is significant.

4.1.3.9. The relevant electrical infrastructure of the Proposed Development at Operational Stage will comply with the current public exposure guidelines, and in line with Appendix 3.7 (Onshore Electric and Magnetic Field Report) of the ES Volume 3 (document reference 6.3.3.7) will include:

- Earthed shielding of the HVAC Cables and HVDC Cables along the Onshore Cable Route;
- Earthed perimeter fencing at the Converter Station compound;
- The Converter Station electrical equipment must be designed to meet the guideline levels; and
- The electrical field within the Converter Station at 1 m above ground level will not exceed 10 kV/m.

4.1.3.10. The assessed components of the Proposed Development produce field strengths which are less than the public exposure limit.

4.1.3.11. The electric and magnetic fields generated by the HVAC and HVDC cables will comply with public exposure guidelines.

4.1.3.12. The appointed contractor will ensure through design and verification that the Proposed Development complies with guidelines and the Code of Practice (Department of Energy & Climate Change , 2012).

Register of Consents

4.1.3.13. A register of consents covering: planning, highway and environmental has been prepared within Other Consents and Licences (document reference 5.2) which will be reviewed and the need for any further consents or licenses tracked by the appointed contractor to keep track of any progress. This will enable the project team to plan for consents to be applied for and obtained prior to the relevant works activity commencing.

4.1.3.14. The progress of the preparation, submission and internal approval of the consents identified as being required will be tracked using a consents register.

Health and Safety File

4.1.3.15. The Health and Safety File would be submitted by the appointed contractor to a programme to be agreed with the Principal Designer.

4.1.3.16. The Health and Safety File would include information about all the following topics, where they may be relevant of the health and safety of any future construction work. The level of detail to be provided would be proportional to the likely risks involved.

- Details of the project – Brief description of the work carried out;
- Residual hazards and how they have been dealt with including:
  - Details of all areas at risk of flooding, their form and detail of the associated danger;
  - If maintenance activities need to be undertaken in areas at risk of flooding staff should be signed up to flood warnings (rainfall, tidal, fluvial, reservoir) and check the weather forecast to be able to plan ahead and avoid attending site if there is a risk of flooding; or
  - If flooding is identified when out on site: – an appropriate level of training to staff should be in place to ensure staff are aware stay away from flood water, abandon any work that needs to be undertaken in flooded areas and report the incident or request appropriately trained operatives to work if a maintenance activity needs to be undertaken.
- A detailed management plan for future maintenance and entry to below ground access chambers will be required (e.g., personal gas alarms, emergency recovery hoists, etc.) particularly in locations where there is a risk of the presence of ground gases such as at Milton Common.
- Key structural principles incorporated in the detailed design of the structures;
- Information regarding the removal or dismantling of installed plant and equipment;
- The nature, location and marking of significant services, including firefighting services; and

- Information and as built drawings of the structure, its plant and equipment.

4.2. COMPETENCE, TRAINING AND AWARENESS

4.2.1.1. The appointed contractor shall identify the training needs of their employees and subcontractors so that they can implement the requirements of this Onshore Outline CEMP into the induction, start of shift briefings, Tool box talks, Construction Phase Plan and construction method statements.

4.2.1.2. Specific training needs will be developed for individuals to reflect the work to be carried out on the Proposed Development and the significant risks and opportunities identified.

4.2.1.3. The requirement is for all personnel to be aware of their general environmental management responsibilities, and for those whose work may cause, or have the potential to cause, a significant impact on the environment, to receive specific environmental awareness briefings. Environmental awareness will be reinforced through information, such as poster campaigns, environmental/sustainability performance indicator reports and environmental alerts available onsite notice boards.

4.2.1.4. All contractors are responsible for ensuring the competency of their environmental staff. In the event that environmental training is needed for staff, a contractor is responsible for ensuring this requirement is fulfilled. Any training provided to members of the project team will be logged by the project administrator via a Project Training Matrix and any certification documents will be produced by the relevant members of staff as evidence that they hold the required competencies.

4.3. INTERNAL COMMUNICATION

4.3.1.1. Communication on environmental issues within the project team will take place through face-to-face conversations, e-mails and telephone calls. The project management team will be made aware of all environmental issues at the earliest possible opportunity. Communication on environmental matters will be maintained through construction meetings chaired by the Environmental Advisor/ Manager or a senior manager.

4.3.1.2. Environmental issues identified by any member of the project team will be communicated to the relevant personnel to ensure any required actions are carried out. Dissemination of information will take place in several forms, as appropriate, including meetings to discuss particular project issues, method statements, task/activity briefings, toolbox talks, inductions, environmental notices and environmental alerts. Records that these have been carried out and who received them will be documented via the use of attendance logs or distribution lists. The Environmental Advisor/Manager will notify Supervisors of any legislation changes which may affect working practices on Site.

4.3.1.3. Any unexpected finds/occurrences by site staff can be reported to their supervisors, which will then give notification to the relevant member of the Environmental team (described in Section 4) who will advise on the course of action to be taken.

4.4. EXTERNAL COMMUNICATION

4.4.1. COMMUNICATION WITH THE CLIENT

4.4.1.1. The appointed contractor will liaise regularly with the client and its representatives regarding the programme of works, nature of the operations and methods to be employed to minimise adverse environmental impacts. This will include progress meetings as well as the production and submission of progress reports which will cover environmental/sustainability issues. The appointed contractor will also supply all relevant supporting information and documentation to the client for matters concerning consents and the environment in accordance with the appropriate timescales.

4.4.2. STATUTORY AUTHORITIES AND OTHER STAKEHOLDERS

4.4.2.1. In the event of stakeholder liaison being required with local authorities or other stakeholders, the appointed contractor will identify the requirement and seek authorisation from the client to undertake the task. Where consultation is required, a representative from the client will be invited to attend alongside the relevant appointed contractor personnel.

4.4.2.2. Project staff will keep an archive of any e-mail correspondence between themselves and statutory authorities and other stakeholders concerning the activities taking place. In the event that any complaints are received a log of correspondence and complaints will be kept up to date by the appointed contractor.

4.4.3. PUBLIC RELATIONS

4.4.3.1. It is good practice to inform interested parties when works are due to commence. The appointed contractor will not communicate with residents unless approval has been granted by the client. A member of the appointed contractor ’s team will be provided with the Public Relations Officer role (see Section 3).

4.4.3.2. Regular stakeholder and traffic management meetings will be held as part of project governance requirements.

4.4.3.3. Any letters issued to interested parties will be drafted and issued by the Client, with inputs from the Public Relations Officer.

4.4.4. COMPLAINTS PROCEDURE

4.4.4.1. As part of the Site set-up process, site notice boards will be erected, maintained and clearly visible to third parties. A telephone number for environmental complaints will be published local to the Site. The Public Relations Officer will be responsible for dealing with any complaints and will have the appropriate authority to resolve any issues that may occur. Should it be required, an 'out of hours' telephone number will be available.

4.4.4.2. The Environmental Manager/ Advisor will maintain a close liaison with the relevant LPA Environmental Health Officer ('EHO') at all times and should any complaints regarding environmental nuisance (e.g. dust or noise) be received by the Public Relations Officer the details will be passed to the EHO for verification purposes.

4.4.4.3. Should any unforeseen event occur within the construction site that has the potential to cause off-site pollution then the Environmental Advisor/ Manager will immediately notify the EHO by phone and e-mail. As timely as possible, notice will be issued to the EHO for dealing with any unforeseen activity which may give rise to a particular problem.

4.4.4.4. During any site work, if any complaints are received directly to the appointed contractor or its subcontractors, the client will be notified as soon as is practicable but within twelve hours of the complaint being received. It will be the responsibility of the appointed contractor's Site Manager to brief any staff responsible for unacceptable working conduct in relation to worksite neighbours whilst working on this project.

4.5. METHOD STATEMENTS

4.5.1.1. The implementation of Method Statements for the different activities of the Proposed Development works shall be completed by the relevant contractor(s) and/ or subcontractor by trained staff or other appropriate experienced personnel, in consultation with specialists. Their production shall include a review of the environmental/ health and safety risks and commitments, so that appropriate control measures are developed and included within the construction process.

4.5.1.2. Method Statements will be reviewed by the appointed contractor's Project Manager and, where relevant, by an appropriate environmental specialist. Where appropriate, and if required or necessary, method statements will be submitted to the regulatory authorities (EA, Natural England, the relevant LPA EHOs and Emergency Planning Officer etc.), as required.

4.5.1.3. Method statements must contain as a minimum:

- Location and duration of the activity, and vehicular access/egress arrangements (if applicable);
- Work to be undertaken and methods of construction;

- Plant and materials to be used;
- Labour and supervision requirements;
- Health, safety and environmental considerations (including relevant control measures); and
- Permit or consent requirements.

4.5.1.4. Deviation from approved method statements (where this is a statutory requirement) will be permitted only with prior approval from the LPA, and other relevant parties. This will be facilitated by formal review before any deviation is undertaken.

4.6. ENVIRONMENTAL INCIDENTS

4.6.1.1. The appointed contractor will respond to any reported incidents within 24 hours, or as soon as reasonable practicable. In the event of working practices being deemed dangerous either by the Council or the HSE, immediate remedial action will be taken.

4.6.1.2. The formal procedure for handling Environmental Incidents will be developed and agreed by the Project Manager, Environmental Advisor and appointed contractor/Construction Manager but may include a procedure similar to that detailed below:

- Environmental Incidents are to be reported to the Construction Manager;
- The Construction Manager (or nominated representative) will record full details of the Environmental Incident and ensure that they are responded to as soon as reasonably practicable (preferably within one hour but always within 24 hours; and
- The Construction Manager (or nominated representative) will undertake an investigation to assess what corrective and preventative action, or further investigation is necessary to avoid recurrence of the Environmental Incident.

4.6.2. EMERGENCY INCIDENT RESPONSE

4.6.2.1. In the event of a spill or leak, the following process shown in Plate 1 will be followed. This will be briefed to the workforce and displayed on site notice boards.

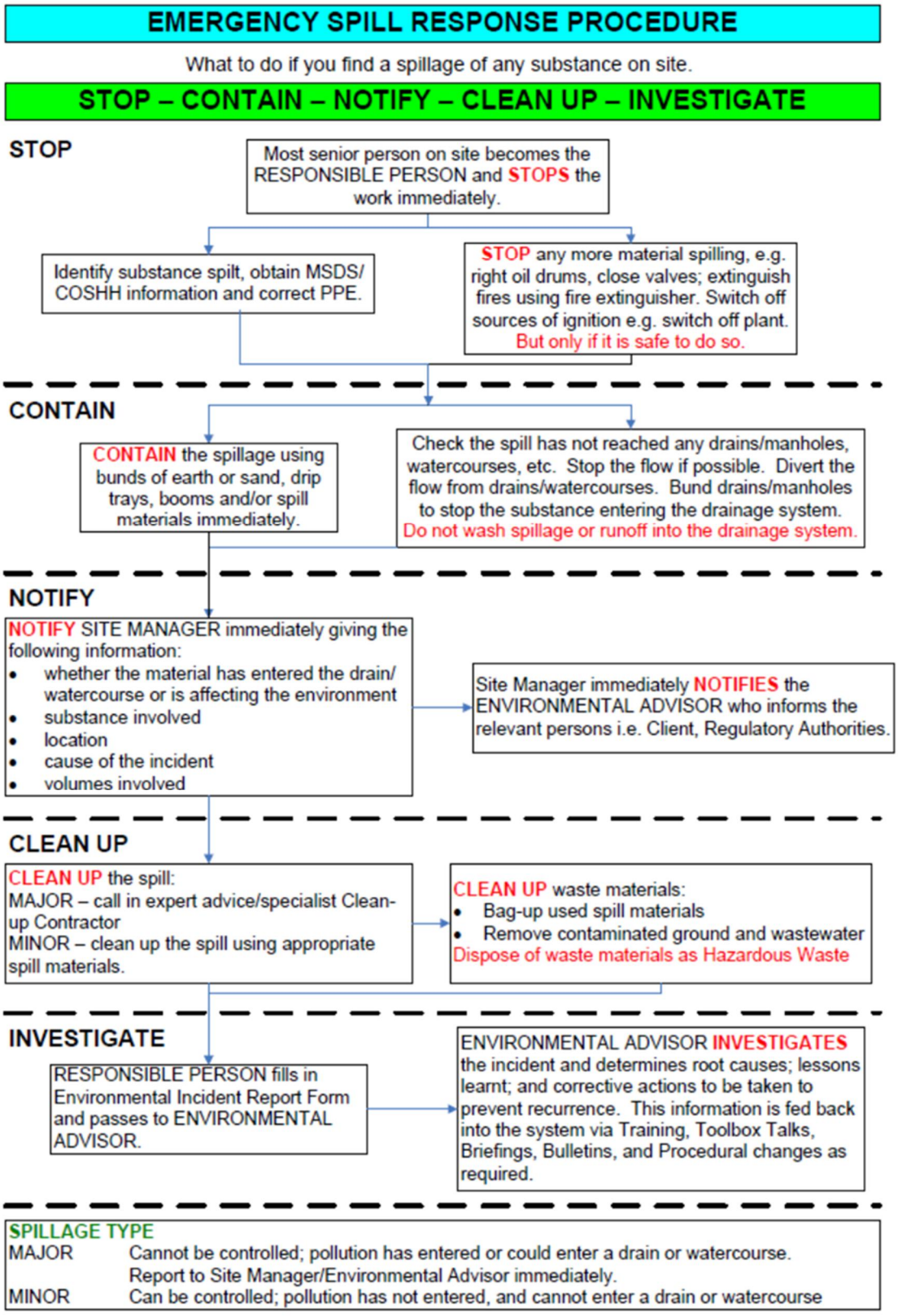

Plate 4.2 - Emergency Spill Response Procedure

5. GENERAL ENVIRONMENTAL CONTROL MEASURES

5.1. INTRODUCTION

5.1.1.1. This section sets out the environmental control measures to be adopted during construction. The appointed contractor will ensure that all sub-contractors adhere to the environmental good practice guidelines for implementation during all site activities.

5.2. LANDSCAPE AND VISUAL AMENITY

5.2.1.1. The following measures may be considered during construction works to ensure protection of the existing landscape setting and views to the construction Site:

- Temporary screening for sensitive visual receptors through implementation of solid construction hoardings whilst using natural existing screens (topsoil and existing vegetation) where practicable. Hoardings would be attractive, used to screen low level “clutter” and reduce noise;
- Appropriate location, organisation and phasing of construction activities;
- Maintenance of a tidy and contained site compound to reduce visual clutter; and
- Large plant /equipment would be located away from most sensitive receptors where there are viable alternatives; and
- Measures to control working hours in specific locations to avoid disturbance to residential receptors both in terms of light and noise.

5.2.1.2. The hoarding to be erected around the Converter Station will visually contain many of the construction activities from the surrounding character areas in terms of influencing their visual setting.

5.2.1.3. Hoardings would be well lit in poorly lit walkways and any gates should be positioned to minimise noise transmitted to nearby sensitive receptors.

5.3. ONSHORE ECOLOGY

5.3.1.1. The following measures may be considered during construction works to ensure ecological disturbance is minimised:

- Where practicable, any mature trees and hedgerows which are within the site boundary will be retained;

- Tree root protection zones will be identified and clearly marked with fencing and signage;
- During the construction period, care should be taken to avoid creation of artificial habitats and temporary resting places within works areas, such as turf, spoil and rubble piles. Stored materials are best located away from areas of vegetation on hardstanding or bare ground. Stored materials can be raised off the ground by using storage bags on pallets;
- Water sprays will be used to manage dust and prevent it drifting from the construction site to surrounding areas where sensitive habitats are present;
- No waste or waste water should be discharged into the watercourses and management procedures to avoid contamination and pollution of waterways should be following and implemented at all times;
- Standard best practice methods that minimise the risk of pollution through accidental spillage of materials or surface runoff during construction works will be implemented. These measures will follow those within measures are described in the "Pollution Prevention for Businesses" guidance published by the UK Government. When working near water, pollution prevention methods will be incorporated into site-specific guidance notes provided to the site operatives as part of a method statement. All vehicles will carry spill kits and all staff be trained in how to use emergency response equipment. A contingency plan in the event of contamination of watercourses will be established and strictly adhered to in such an event. Site compounds and materials storage areas will not be located adjacent to watercourses. Potentially contaminating materials will be stored appropriately in accordance with current guidelines to minimise pollution risk, including bunding fuel and chemical storage areas and generators. Site procedures will be carefully managed to avoid discharges to watercourses, in particular those involving cement and concrete;
- Restriction of night working – construction work will be restricted to daylight hours between dawn and dusk within areas without public street lighting (e.g. Denmead Meadows, Farlington Playing Fields and the Converter Station Area) during the bat active season (April to October) to avoid disturbance effects of noise and lighting on bats. Surveys have identified and assessed potential impacts and their effects on ecological features. However, the mobile nature of many protected and notable species is acknowledged. The Environmental Clerk of Works will monitor the site and be aware of the possibility of unexpected finds of protected and notable species. With support of appropriately experienced technical specialists, the Clerk of works will monitor the Proposed Development for species including badgers, water voles and otters that are known to be present in the wider area. In the event of an unexpected find of such a species, an ecologist will advise the

Clerk of Works on a course of action to offset potential effects and maintain legislative compliance;

- Wildlife and Countryside Act Schedule 9 plants are present close to the Proposed Development, specifically Japanese knotweed that was recorded on the boundary of the Order Limits at allotments at Lock Lake (Section 9). It is an offence to cause Schedule 9 plants to grow in the wild. Prior to vegetation clearance within the Order Limits a survey for Schedule 9 plants will be undertaken to identify their locations, and appropriate control measures to either remove and eradicate them, or localise them (e.g. fencing), will be put in place. Regular checks of the works area by the Ecological Clerk of Works will be undertaken to ensure risks associated with Schedule 9 plants are controlled and works will not cause their spread in the wild. Appendix 16.2 (Preliminary Ecological Appraisal) of the ES Volume 3 (document reference 6.3.16.2) notes the location; and
- Any required scrub, hedgerow and/or tree clearance should be timed to avoid the main nesting season for birds between 1 March and 31 August. If scheduled within this period a suitably experienced ornithologist will be present to advise on any necessary protective measures, and confirm that the works are not likely to cause disturbance to nesting birds.

5.3.2. PRECAUTIONARY METHODS TO AVOID EFFECTS ON HEDGEHOGS

- To avoid killing or injury to hedgehogs that may be present hedgehogs, scrub and other dense vegetation within Sections 1-3 where suitable habitat is present will be hand search for hedgehogs prior to its clearance. Piles of cut vegetation such as brash piles will also be searched as the can harbour sheltering hedgehogs.
- Hedgehogs found will be moved to a suitable release site away from the development within scrub, hedgerow or other dense cover.
- In addition, open excavations will be fitted with mammal ladders (planks of wood at either end) to allow animals to climb out if they fall in, and prevent the trapping of animals including hedgehogs.

5.3.3. PRECAUTIONARY METHODS TO AVOID EFFECTS ON REPTILES

5.3.3.1. To avoid killing or injury to reptiles that may be present, a Precautionary Method of Works ('PMoW') will precede vegetation clearance and earthworks in habitats which could support these animals. created which will detail how working methods during the Construction Stage of the Proposed Development can minimise the risk of killing or injury to reptiles.

5.3.3.2. Such working methods likely to feature in a PMoW may include, but are not limited to, the following:

- Two stage vegetation clearance of fields, whereby areas of suitable habitat for reptiles are cut down to a height of 300 mm, left for a period to enable reptiles to disperse, and then cut to ground level under ecological supervision;
- Removal of natural refugia by hand where safe to do so, or otherwise undertaken methodically using plant under ecological supervision;
- Plant and machinery to be kept to defined access routes around the Survey Area which are unsuitable for reptiles, until suitable habitat in the works area has been removed; and
- Open excavations will be fitted with mammal ladders (planks of wood at either end) to allow animals to climb out if they fall in, and prevent the trapping of animals including reptiles.

5.3.3.3. The appointed contractor will comply with relevant legislation and should maintain habitats intact and undisturbed, where practicable. If protected species are unexpectedly discovered, work should cease and advice should be sought immediately from a suitably qualified ecologist.

5.3.3.4. Implementation of the measures identified will be monitored by an Environmental Clerk of Works with the power to stop work and change site practices as required.

5.3.4. ARBORICULTURE

5.3.4.1. Adherence to British Standards 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS 5837) when laying cables shall be adhered to. Root Protection Areas ('RPA's') shall be avoided.

5.3.4.2. Mitigation of impacts can be achieved by avoiding high value features through considering the use of alternative trenching or installation methods where practicable.

5.3.4.3. Where features are to be removed, consideration for replanting with like for like species in the locality is required. Hedgerow trees will require repositioning to at least 5 m away from the Onshore Cable Route. Mitigation may also be achieved by appropriate compensatory tree planting within the locality.

5.3.4.4. Ground protection shall be used where RPA's are encroached upon. For example, use of a no-dig construction for access routes shall be employed.

Converter Station Area

5.3.4.5. Under no circumstances should any works or storage take place within 15 m of ancient woodland. When storing materials, particularly liquids, slopes and drainage channels must be considered to prevent spillages and flow into the buffer zone.

Onshore Cable Corridor

5.3.4.6. The Onshore Cable Corridor, within the highway, is constrained by land ownership, buildings, under and over ground services, street furniture and traffic considerations. Therefore, options for avoiding trees will need to be carefully considered.

5.3.4.7. The general design principles for working around trees are as follows:

- Onshore Cable Route will be diverted around or under RPAs, where practicable.
- Onshore Cable Route will avoid higher value trees as indicated in this report. In particular, Category A trees will be avoided.
- Onshore Cable Route will avoid existing soft landscape areas containing RPA of arboricultural features, where practicable. In accordance with the required standoff for overhead and underground cables, the use of soft landscape resources such as grass verges, particularly in highway, will limit any future mitigatory tree planting opportunities and can permanently detrimentally affect the local landscape.
- Tree roots are likely to be infrequent within the carriageway construction due to lack of soil available for root growth. However, roots may persist at greater depths where conditions are favourable. Where practicable, cable routing in the carriageway will be considered.
- Significant tree roots are likely to be frequent within footway, verge areas and other soft landscape where trees are present. Works in these areas shall be avoided, where practicable.

5.4. SOILS AND AGRICULTURAL LAND USE

5.4.1.1. Development of a Soil Resources Plan ('SRP'). A SRP is prepared prior to the commencement of construction and confirms the different soil types and depths (based on the soil surveys already undertaken); the most appropriate re-use for the different types of soils within the detailed design; and the proposed methods for handling, storing and replacing soils on site. For the Onshore Cable Corridor, the SRP will confirm the different soil types and depths to be disturbed, the proposed methods for handling, storing and replacing soils, and provide specifications for the restored soil profiles to match the original profiles as closely as possible. An Outline SRP has been prepared (see Appendix 5 of this Onshore Outline CEMP).

5.4.1.2. Mitigation to ensure that the temporary requirement for land will not affect the ability to farm other land within the holding that is not affected by construction works, will form part of the CEMP. This would include the continuation of farm access to temporarily severed land, as required for normal agricultural activities, the replacement of temporarily severed water supplies, and the installation of temporary stockproof fencing, as required.

5.5. GROUND CONDITIONS

5.5.1.1. The following methods should be implemented during construction to ensure the safety of construction workers, visitors and to avoid any potential pollution of surface and groundwater:

- The Proposed Development will adhere to Environment Agency ('EA') pollution prevention guidance and best practice during the construction works which will be incorporated into and managed through the CEMP.
- All construction personnel would be required to wear appropriate PPE and to only undertake work following a Health and Safety risk assessment and a Health and Safety Induction. Hygiene and welfare facilities would need to be provided for use by construction personnel during the works. A watching brief would be implemented during excavation to ensure that any unexpected contamination within the Made Ground (if present) is rapidly identified, risk assessed and dealt with appropriately.
- A watching brief would be implemented during excavation to ensure that any unexpected contamination within the Made Ground (if present) is rapidly identified, risk assessed and dealt with appropriately.
- Regular monitoring visual inspections during construction.
- If remediation is deemed necessary, requirements will be assessed on a site-specific basis and the works carried out, supervised, validated and verified in accordance with current best practice.
- Good working practices and housekeeping during construction such as sealing or covering stockpiles of contaminated soils and treating water removed from excavations prior to discharge are considered likely to reduce identified impacts.
- Water/surfactant will be sprayed onto material being worked to damp down any potentially contaminated dust and prevent it from becoming airborne. Temporary surface water drainage and vehicle wheel washes will further reduce the risk of dust generation. Precautions should also be taken while transporting excavated materials off-site to ensure that any risk of fugitive dust emissions are prevented. Construction Stage air monitoring may be used to check the effectiveness of damping down of the dust on site. Vehicle movements will be restricted to an agreed travel plan and construction activities on site will not exceed standard working hours, unless explicitly required to do so.
- Water removed from any excavations will be disposed of or discharged in accordance with EA requirements.

- The reuse of soil on Site should be governed by the production of a Materials Management Plan ('MMP') in which chemical criteria are specified for the import of soils/fill material from off-site and for the reuse of site won material (see Appendix 4 for the Outline MMP). The stripping, storage and reuse of subsoil should be carried out in accordance with BS 8061:2013.
- Foundations for structures at the Converter Station (Section 1) will require piles that will extend down into the chalk groundwater aquifer. A Piling Works Risk Assessment ('PWRA') has been Prepared by WSP, following accepted, best practice EA Guidance. This PWRA will ensure that piling operations do not form a pathway for the migration of contamination at the surface (either existing contaminants, those that form part of the pilling process or those that might be introduced during the operation of the Converter Station) to the aquifer. Pilling for the launch pit of the Kings Pond Horizontal Directional Drilling ('HDD') will not interact with the Chalk and therefore the aquifer is not at risk from these operations.
- Construction activities should also be undertaken in accordance with appropriate CIRIA guidance. Specifically, this should include:
  - CIRIA C741. Environmental Good Practice on site (4th Edition): (CIRIA C741, 2015); and
  - CIRIA C532. Control of Water Pollution from Construction Sites (CIRIA C532, 2001).

5.6. GROUNDWATER

5.6.1.1. It is assumed that standard mitigation measures, including a variety of good environmental site practices, will be undertaken at the Proposed Development during the site preparation, earthworks and installation phases to minimise the risk of site runoff transmitting contaminants and sediment into surface waterbodies via the surface water drainage system.

5.6.1.2. A variety of good environmental site practices will be implemented to avoid or minimise impacts at the source. Such measures include, but are not limited to, the following:

- Working areas shall be clearly defined to ensure the disturbance of soils is minimised, where practicable;
- Haul routes and accesses shall be clearly defined to minimise the risk of accidents. Construction vehicles will be regularly inspected and maintained to reduce the risk of hydrocarbon contamination associated with leaks and spillage and will only be active when required;
- The cleaning of vehicle wheels prior to leaving site;

- Dust suppression (i.e. damping down);
- Installation of systems such as silt traps and swales designed to trap silty water including adequate maintenance and monitoring of these to ensure effectiveness, particularly after adverse weather conditions;
- Designated areas for the storage of hazardous materials, fuels and chemicals. All designated areas will be appropriately bunded to at least 110% capacity and all filler points/valves will be located within the extent of bund or appropriate drip trays provided;
- On-site availability of oil spill clean-up equipment including absorbent material and inflatable booms for use in the event of an oil spill or leak;
- Use of drip trays under mobile plant;
- Provision of environmental awareness training for site workers; and
- Use of inert, uncontaminated material during construction.

5.6.1.3. The risk of pollution to surface and groundwater can be significantly reduced by the adoption of good working practices and strict adherence to guidance provided by the EA on Gov.uk. The current guidance on gov.uk explains how to:

- Report an environmental incident;
- Get permission to discharge to surface water and groundwater;
- Manage business and commercial waste;
- Store oil and any oil storage regulations;
- Discharge sewage with no mains drainage; and
- Work on or near water and manage water on land

5.6.1.4. Guidance is also available in the following CIRIA publications;

- C532 - Control of Water Pollution from Construction Sites;
- C698 Site handbook for the construction of Sustainable Drainage System ('SuDS'); and
- C648 - Control of Water Pollution from Linear Construction Projects.

5.6.1.5. Best practice recommendations for the prevention of contamination will be outlined in the detailed CEMP or equivalent, and agreed with relevant statutory consultees prior to commencement of construction works. This will include measures to comply with relevant legislation and guidance (including the EA's Guidance online) and best practice measures in line with the Considerate Contractors Scheme and 'Site handbook for the construction of SUDS' (CIRIA C698). It will include an erosion

prevention and sediment control plan to reduce the quantity of sediment entrained in runoff.

5.6.1.6. It is recommended that surface runoff from the various construction areas within the site is managed by the use of temporary bunding and settlement ponds to protect the receiving water environment. Settlement ponds are beneficial in that they allow for isolation and on-site treatment of sediment laden or chemically contaminated surface water runoff prior to discharge, following agreement with the appropriate authority, or use of other appropriate means of disposal.

5.6.1.7. Movement of materials around the site will be managed under an appropriate MMP.

5.7. SURFACE WATER RESOURCES AND FLOOD RISK

5.7.1. GENERAL PRINCIPLES

5.7.1.1. Consents or exemptions are expected to be required for the following consents/ permits, which should be further reviewed and confirmed during detailed design process by the appointed contractor:

- Temporary dewatering consent;
- Ordinary watercourse consent;
- Flood risk activities permit – environmental permits; and
- Discharges to surface water and groundwater: environmental permits.

5.7.1.2. Activities expected to require the above noted additional permits and consents are summarised below:

- Works within 16m and 8m of tidal and fluvial flood defences;
- Works within the flood plain;
- Works through, under or above a watercourse;
- Works requiring diversions or alterations to Ordinary Watercourses or extreme event surface water overland flow routes; and
- Works requiring temporary dewatering of surface water or groundwater.

5.7.1.3. The overarching principles required to obtain these approvals are summarised below, however specific methodologies are not defined to allow flexibility for the appointed contractor to conduct works in accordance with their preferred practices.

5.7.1.4. As part of the Onshore Outline CEMP, it is proposed that:

- The appointed contractor (and any sub-contractors) must take precautions during the Construction Stage to protect all surface water bodies including watercourses and drainage patterns from erosion, siltation or pollution in accordance with industry best practice. To prevent fine sediment entering the watercourses, construction activities should take place away from the watercourses and extreme

event overland flow routes, where practicable. Should vegetation clearance be required, the extent should be limited to the areas necessary to reduce the amount of sediment released during clearance and the potential release of sediment from bare ground following clearance. Further recommended pollution prevention mitigation measures for adoption by the contractor include:

- All operatives should be made aware of the need to protect the watercourse from contamination, including EA guidance and legal obligations.
- When construction activities, including stock piling (not permitted within fluvial flood zone 2 or 3 unless otherwise agreed with EA) and plant and vehicle washing, occur in close proximity to a watercourse they should be separated from the watercourse with barriers (e.g. sediment fences) to prevent surface runoff from these sites entering the watercourse.
- Geotextile-material silt fences should be installed to filter suspended solids from runoff.
- Timing of works should be carefully considered around areas at risk of flooding and adjacent to watercourses. Where practicable, construction should be carried out during periods of low flow and rainfall (typically during summer months) to reduce the risk of pollution and erosion.
- The works should be carried out in accordance with established best practice and environmental permitting requirements.
- Pollution spill kits should be kept on site. In the event of an incident these would be used.
- Any soils contaminated would be removed immediately to a suitable landfill site.
- Waste facilities should be provided on site for debris away from areas at risk of flooding.
- Cleaning of tools and shuttering will be carried out in water not draining directly to the watercourse.
- In any event of expected heavy rain pouring concrete and other activities which increase the risk of contaminating runoff should not be undertaken.
- Activities near watercourses should be avoided during fish migratory and spawning seasons (typically October to May), where practicable.
- The control on invasive non-native species should be managed through best practice guidance and by implementing the Wildlife Law: Control of Invasive Non-native Species HC1039 (Law Com No. 342).

- The appointed contractor (and any sub-contractors) must obtain appropriate approval through appropriate consents and permits to undertake any construction activity or appropriate exception prior to commencement of that activity and is responsible for agreeing the construction methodologies in association to these consents and permits.
- The appointed contractor (and any sub-contractors) must ensure that existing Main River, Ordinary Watercourses, extreme event surface water overland flow routes are maintained within no increase to flood risk through appropriate temporary works and subject to approval or exemption of relevant environmental permits (flood risk activities permit/ ordinary watercourse consent).
- The appointed contractor (and any sub-contractors) must ensure any works over, under or directly adjacent to watercourses/watercourse structures (culvert/ sewer) and flood defences are subject to approval or exemption of environut permits (flood risk activities permit/ordinary watercourse consent), where the contractor will need to develop appropriate design and construction methodologies to ensure that flood risk is not increased, the integrity of these features are not negatively impacted, flow conveyance is not impacted and there is suitable pollution prevention measures in place during construction and operation.
- The appointed contractor (and any sub-contractors) will manage any potential surface water ingress or groundwater emergence that is deemed of a quantity unsafe to work in or that may create a pollution pathway which should be managed through temporary dewatering with and discharge at a controlled discharge rate to an agreed discharge location through an appropriate pollution treatment mechanism. Dewatering quantities for trench construction will be determined at detailed design. The designer must ensure the discharge quantities are accurate or conservative to ensure no flood risk is not increased due to surplus groundwater encountered during construction.
- Best practice methodology, in accordance with EA, Lead Local Flood Authority ('LLFA') guidance and other recommendations, should be implemented during construction to minimise the potential impacts of the Proposed Development on flood risk and potential contamination of surface waters.
- All construction activities will be undertaken in accordance with legislation and the gov.uk/EA Environmental Permits, Regulatory Position Statements and Guidance and other relevant documentation.
- The appointed contractor (and any sub-contractors) must ensure that works within flood zone 2 or 3 do not introduce significant structures or spoil storage in the flood plain.

- The appointed contractor (and any sub-contractors) for works within flood zone 2 or 3, or directly adjacent to, should ensure a flood warning/ evacuation plan will be in place to halt works if there is an immediate risk of flooding.
- The appointed contractor (and any sub-contractors) should aim to identify locations for joint bays/link pillars and link boxes outside of flood zones 2 and 3 or areas at risk of surface water flooding where practicable, however if this is not practicable due to other constraints, during construction any works in the flood zone 2 or 3 would be subject to approval or exemption of a flood risk activities permit or exemption and works within areas at risk of surface water flooding would be subject to approval or exemption of an ordinary watercourse consent.
- If the appointed contractor decides to use temporary bunds to protect the trench or construction works, these would be in small localised areas and any impacts on existing drainage regime will need to be managed to ensure the impact of flooding is not increased subject to approval or exemption of relevant environmental permits (flood risk activities permit/ordinary watercourse consent).
- The detailed design of the HDDs is proposed to be developed post application and any specific provisions to protect the HDD construction works from the tidal flood risk will be developed by the contractor prior to works, if required. Any pathways under a flood defence created through the HDD during construction and operation will require appropriate bunding to ensure a pathway is not created around the flood defence subject to approval from approval or exemption of a flood risk activities permit.
- Any works over, under or directly adjacent to watercourses/watercourse structures (culvert/sewer) and flood defences will be subject to approval or exemption of environmental permits (flood risk activities permit/ ordinary watercourse consent), where the contractor will need to develop appropriate design to ensure that the integrity of these features are not negatively impacted, flow conveyance is not impacted and there is suitable pollution prevention measures in place during construction and operation.

5.8. HERITAGE AND ARCHAEOLOGY

5.8.1.1. The archaeological and cultural heritage mitigation outlined here comprises high-level general measures to minimise or reduce adverse effects arising from disturbance from the works on the surrounding historical assets. Where impacts have been identified and subject to the nature of the asset and the potential impact, consideration has been given to a range of mitigation measures, these include but are not limited to:

- Archaeological monitoring during construction to ensure appropriate recording of any remains encountered; and

- Proximity to Designated Heritage Assets must be taken into consideration during construction.

5.8.1.2. When undertaking construction works the contractor should take into account nearby Designated Heritage Assets, such as listed buildings, including curtilage structures (i.e. associated assets with the property extent such as boundary walls, which may not be mentioned specifically in the listing description). The Designated Assets are identified in Chapter 21 (Heritage and Archaeology). Where the Order Limits is in close proximity to those assets, care should be taken to prevent accidental strike damage from plant movement and construction activities. As set out in Chapter 21 of the EIA, it is assumed that the Onshore Cable Route will be located in the existing highway and not in the pavement adjacent to nearby Designated Heritage Assets where vibration could cause damage.

5.8.1.3. The mitigation strategy proposed to mitigate predicted archaeological construction related impacts identified is set out below. Three strategies are presented:

- Strategy 1: Greenfield areas (i.e. open rural or undeveloped land) – archaeological evaluation and mitigation;
- Strategy 2: Brownfield areas (i.e. Joint Bays ('JB'), Transition Joint Bays ('TJB') and HDD entry/exit points) – archaeological evaluation (where practicable) and mitigation; and
- Strategy 3: Brownfield area (i.e. along existing roads, pavements and hardstanding) – mitigation.

Strategy 1: Greenfield area evaluation and mitigation

5.8.1.4. Within the greenfield areas of the Order Limits (Sections 1-3), proposed ground disturbance would be extensive due to the preliminary topsoil strip. This is assumed to be site-wide for the Converter Station Area and also within the Onshore Cable Corridor working width, along with temporary access routes and temporary compounds (up to 19 m wide).

5.8.1.5. Within these areas, the presence, nature, date, extent and significance of any archaeological remains present would need to be clarified by trial trench evaluation as the potential for such remains, as assessed by the desk-based and Stage 1 Geophysical Survey, is uncertain. These will be targeted to geophysical anomalies of potential archaeological interest, along with any remains identified by the desk-based research, but will also include sampling of 'blank areas'.

5.8.1.6. The results of the evaluation will enable the Applicant to formulate with the relevant statutory consultees an appropriate mitigation strategy for any significant archaeological remains that could be affected.

5.8.1.7. Mitigation could take the form of a targeted archaeological excavation (preservation by record) well in advance of the commencement of ground works and/or an

archaeological watching brief (a programme of 'strip, map and sample) carried out alongside the preliminary topsoil removal. This would ensure that archaeological remains were not removed without record. This would need to be programmed with adequate time for the recording of archaeological remains.

5.8.1.8. Although rare, in the unlikely event that archaeological remains of very high (national) significance are identified, there may be a requirement, where practicable, for their preservation *in situ*, i.e. through modifications to the design, e.g. modification in design of foundations and formation levels for the Converter Station, or avoidance in the adjustment of the position of the Converter Station and/or the line of the Onshore Cable Route.

5.8.1.9. Any archaeological work would need to be undertaken in consultation with the relevant Archaeological Advisor, in accordance with an approved archaeological Written Scheme of Investigation ('WSI') outlining the scope and method of investigation, along with the post-excavation reporting and dissemination strategy.

Strategy 2: Brownfield area evaluation and mitigation

5.8.1.10. JBs, TJBs and HDD compounds in brownfield areas would entail more than the localised disturbance of the proposed cable trench, with the excavation of larger and deeper trenches, approximately 15 m x 5 m, to a depth of 3 m (JBs) and up to 1.75 mbgl. For such areas, archaeological trial trench evaluation may be appropriate depending on the depth of modern made ground.

5.8.1.11. As with the greenfield evaluation, this would aim to clarify the presence, nature, date, extent and significance of any archaeological remains within the area of excavation and would enable the formulation of an appropriate mitigation strategy.

5.8.1.12. In areas where evaluation trial trenching is not considered feasible, the proposed strategy will revert to Strategy 3 (see below).

Strategy 3: Brownfield area mitigation of the cable trench

5.8.1.13. The majority of the Onshore Cable Corridor passes through urban areas along existing roads, pavement and hardstanding. For these areas, the proposed archaeological impact would be highly localised and restricted to the approximate 1.0 m wide by 1.3 m deep cable trench, with no impacts from a 'working width' (i.e. no topsoil strip). Modern made ground is anticipated to be present, possibly to a depth of 0.5 m or greater. Archaeological remains in such areas are also likely to have been partially or wholly truncated by modern infrastructure development.

5.8.1.14. For this reason, the preliminary surveys proposed for the greenfield parts of the Order Limits would be neither feasible nor appropriate. In order to mitigate the localised impact of the cable trench on any potential archaeological remains, an archaeological watching brief would be required *in areas with potential for significant surviving archaeological remains,* and where the cable corridor would divert away from existing

highways (i.e. on adjacent roadside verges/hardstanding). This would ensure that any archaeological assets were not removed without record.

5.8.1.15. The archaeological watching brief would be carried out during the Construction Stage during the excavation of the cable trench, with work halted to allow sufficient time to excavate, sample, and record any archaeological remains exposed.

5.8.1.16. The level of archaeological watching brief attendance is likely to vary depending on the predicted sensitivity along the Onshore Cable Corridor. The future WSI would present the approach, ranging from continuous attendance in sensitive areas to regular attended for areas with low to moderate potential. For areas where there would be no impact (i.e. landfill zones/modern highways), no attendance would be required.

5.8.1.17. The archaeological watching brief would need to be undertaken in accordance with an approved archaeological WSI outlining the scope and method of investigation, along with the post-excavation reporting and dissemination strategy.

Palaeoenvironmental sampling

5.8.1.18. The archaeological strategies proposed above would require an element of palaeoenvironmental sampling, where the potential for such has been identified. This might include proposed disturbance in coastal alluvial/fluvial zones adjacent to Langstone Harbour and in areas of raised marine deposits, where they would be affected.

5.8.1.19. This would typically entail sampling during the intrusive fieldwork discussed above (and set out in the WSI), and geoarchaeological analysis in order to develop an understanding of past environmental conditions of the local area.

5.8.1.20. In light of the shallow nature of the proposed impact along the Onshore Cable Corridor, deep sampling through the use of purposive geoarchaeological boreholes, along with the creation of a geoarchaeological deposit model, is not considered appropriate.

5.9. TRAFFIC AND TRANSPORT

5.9.1.1. The construction of the Proposed Development will be required to comply with the Traffic Management Strategy ('TMS') and Construction Traffic Management Plan ('CTMP'). A Framework TMS and Framework CTMP are provided as appendices to the Environmental Statement (document references 6.3.22.1A and 6.3.22.2).

5.9.1.2. The Framework TMS provides details of traffic management measures to be deployed to facilitate construction of the Onshore HVDC Cables. The Framework TMS includes details of temporary traffic signals, lane closure and road closure requirements and a programme that aims to minimise disruptions of the construction works through timing of works at key locations to avoid constraints such as school terms and major events.

5.9.1.3. The Framework CTMP provides an overarching plan of how construction traffic and site operations will be managed across the Onshore Components of the Proposed Development. The Framework CTMP sets out the parameters within which contractors will be required to work, including hours of operation, traffic routing, safe vehicular access and requirements to minimise traffic impacts.

5.9.1.4. Prior to commencement of works in the highway, AQUIND will submit detailed designs for the works and the traffic management measures for approval to the relevant Highway Authority.

5.10. AIR QUALITY

5.10.1.1. The following general mitigation measures should be implemented on site in line with best practice, IAQM guidelines. Table 5.1 should be read in conjunction with Table 5.2 as the mitigation required is commensurate with the assessed level of dust risk for each section.

Table 5.1 - IAQM Mitigation resulting from the Construction Dust Assessment

Mitigation Measure	High Risk Site	Medium Risk Site
Communications		
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	Highly Recommended	Highly Recommended
2. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	Highly Recommended	Highly Recommended
3. Display the head or regional office contact information.	Highly Recommended	Highly Recommended

Mitigation Measure	High Risk Site	Medium Risk Site
4. Develop and implement a Dust Management Plan ('DMP'), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in the IAQM Guidance. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.	Highly Recommended	Highly Recommended
Site Management		
5. Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Highly Recommended	Highly Recommended
6. Make the complaints log available to the local authority when asked.	Highly Recommended	Highly Recommended
7. Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	Highly Recommended	Highly Recommended

Mitigation Measure	High Risk Site	Medium Risk Site
8. Hold regular liaison meetings with other high-risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	Highly Recommended	Not required
Monitoring		
9. Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.	Highly Recommended	Desirable
10. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	Highly Recommended	Highly Recommended
11. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	Highly Recommended	Highly Recommended

Mitigation Measure	High Risk Site	Medium Risk Site
12. Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where practicable, commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	Highly Recommended	Highly Recommended
Preparing and Maintaining the Site.		
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.	Highly Recommended	Highly Recommended
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	Highly Recommended	Highly Recommended
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.	Highly Recommended	Highly Recommended
16. Avoid site runoff of water or mud.	Highly Recommended	Highly Recommended
17. Keep site fencing, barriers and scaffolding clean using wet methods.	Highly Recommended	Highly Recommended
18. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	Highly Recommended	Highly Recommended

Mitigation Measure	High Risk Site	Medium Risk Site
19. Cover, seed or fence stockpiles to prevent wind whipping.	Highly Recommended	Highly Recommended
Operating vehicle/machinery and sustainable travel		
20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London Non-Road Mobile Machinery ('NRMM') standards, where applicable.	Highly Recommended	Highly Recommended
21. Ensure all vehicles switch off engines when stationary – no idling vehicles.	Highly Recommended	Highly Recommended
22. Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	Highly Recommended	Highly Recommended
23. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	Highly Recommended	Desirable
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	Highly Recommended	Highly Recommended
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	Highly Recommended	Desirable

Mitigation Measure	High Risk Site	Medium Risk Site
Operations		
26. Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	Highly Recommended	Highly Recommended
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where practicable and appropriate.	Highly Recommended	Highly Recommended
28. Use enclosed chutes and conveyors and covered skips.	Highly Recommended	Highly Recommended
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Highly Recommended	Highly Recommended
30. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	Highly Recommended	Highly Recommended
Waste management		
31. Avoid bonfires and burning of waste materials.	Highly Recommended	Highly Recommended
Measures Specific to Hard Surface Removal (e.g. asphalt)		

Mitigation Measure	High Risk Site	Medium Risk Site
33. Ensure effective water suppression is used during Hard Surface Removal operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	Highly Recommended	Highly Recommended
34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.	Highly Recommended	Highly Recommended
35. Bag and remove any biological debris or damp down such material before Hard Surface Removal.	Highly Recommended	Highly Recommended
Measures Specific to Earthworks		
36. Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable	Highly Recommended	Desirable
37. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as is practicable.	Highly Recommended	Desirable
38. Only remove the cover in small areas during work and not all at once.	Highly Recommended	Desirable
Measures Specific to Construction		
39. Avoid scabbling (roughening of concrete surfaces) if possible.	Highly Recommended	Desirable

Mitigation Measure	High Risk Site	Medium Risk Site
40. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	Highly Recommended	Highly Recommended
41. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	Highly Recommended	Desirable
42. For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.	Desirable	Desirable
Measures Specific to Trackout		
43. Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	Highly Recommended	Highly Recommended
44. Avoid dry sweeping of large areas.	Highly Recommended	Highly Recommended
45. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	Highly Recommended	Highly Recommended
46. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	Highly Recommended	Highly Recommended

Mitigation Measure	High Risk Site	Medium Risk Site
47. Record all inspections of haul routes and any subsequent action in a site log book.	Highly Recommended	Highly Recommended
48. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	Highly Recommended	Highly Recommended

Mitigation Measure	High Risk Site	Medium Risk Site
49. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	Highly Recommended	Highly Recommended
50. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	Highly Recommended	Highly Recommended
51. Access gates to be located at least 10 m from receptors where practicable.	Highly Recommended	Highly Recommended

Table 5.2– Summary table of Dust risk results per Onshore Cable Corridor Section

Section	Overall Dust Risk
1 Lovedean (Converter Station Area)	Medium
2 Anmore	High
3 Denmead/Kings Pond Meadow	High
4 Hambledon Road to Farlington Avenue	High
5 Farlington	High
6 Zetland Field to Sainsbury's Car Park	High
7 Farlington Junction to Airport Service Road	High
8 Eastern Road (adjacent to Great Salterns Golf Course) to Moorings Way	High
9 Moorings Way to Bransbury Road	Medium
10 Eastney (Landfall)	Medium

5.11. NOISE AND VIBRATION

5.11.1. BEST PRACTICABLE MEANS

5.11.1.1. At all stages of the construction assessment, it will be important to ensure that Best Practicable Means ('BPM'), as defined in the Control of Pollution Action 1974 is followed. This will comprise employing reasonably practicable noise and vibration mitigation measures, with simultaneous regard to local conditions and circumstances (e.g. proximity of sensitive receptors) and current technical knowledge (e.g. utilising quietest equipment available) and to financial implications. Details of specific BPM to be employed during the construction works are included below and in Appendix 24.2 of Chapter 24 (Noise and Vibration):

5.11.1.2. The following mitigation measures should be adopted at all times during construction activities. These measures will be most important to observe at the following times:

1. Where works are being undertaken close to the extremities of the Order Limits and, therefore, closest to sensitive receptors; and
2. When works are being undertaken during periods when surrounding sensitive receptors are highly sensitive to noise (e.g. at night-time for residential receptors).

5.11.2. BPM MEASURES TO BE EMPLOYED DURING ALL CONSTRUCTION ACTIVITIES

General

- The contractor will comply with the requirements of the Control of Pollution Act 1974 (with particular reference to Part III), the Health and Safety at Work Act 1974, the Control of Noise at Work Regulations 2005 and the Control of Vibration at Work Regulations 2005.
- The appointed contractor(s) for construction should consider registering their site(s) under the Considerate Constructors Scheme, which is recognised by industry and the Government for encouraging construction firms to be sensitive to the environment.
- Site personnel should be instructed on Best Practice Mitigation Measures to reduce noise and vibration as part of their site induction training.
- Shouting and raised voices shall be kept to a minimum. Use of radios is to be limited to where two-way communication is required for safety reasons.
- Deviation from approved method statements will only be permitted with prior approval from the appointed contractor and other relevant parties. This will be facilitated by formal review before any deviation is undertaken.

Community Liaison

- Correspondence (e.g. letter drop) should be sent to occupiers of all sensitive receptors likely to be affected by construction activities well in advance of construction activities taking place. The correspondence should contain the following information:
  - A brief description of the proposed activities and reasons why the works are required.
  - The dates and times of proposed construction activities.
  - Contact details (phone number and emails address) for the Client and contractor undertaking the works, which could be used by the public to ask questions or raise complaints.
- Should works be delayed or re-programmed, local residents should be informed of the revised programme of works as soon as possible.
- Any noise complaints will be reported to the appointed contractor and immediately investigated, including a review of mitigation measures for the activity that caused the complaint.

Equipment

- Modern, silenced and well-maintained plant will be used at all times, conforming to standards set out in EU Directives.
- Consideration will be given to avoiding the use of percussive plant where non-percussive methods are available for a given activity.
- Equipment and vehicles should be shut down or turned off when not in use.

Deliveries

- Where practicable, construction plant should access construction areas via arterial roads or main carriageways, in order to minimise noise and vibration at dwellings on the rural or local road network.
- Unless agreed in advance, all deliveries will be during the agreed construction working hours for each activity and on a “just-in-time” basis to minimise idling vehicles.
- Loading and unloading of vehicles, dismantling of equipment such as scaffolding or moving equipment or materials around the construction sites will be conducted in such a manner as to minimise noise.

Screening

- Where necessary, any noise screening around construction compounds would be constructed as early as possible in the construction programme.

- Semi-static equipment is to be sited and oriented as far away as is reasonably practicable from noise sensitive receptors and will utilise localised screening if feasible and required.

5.12. SOCIO-ECONOMICS

5.12.1. EMPLOYMENT GENERATION

5.12.1.1. Measures would be put in place, where practicable, to maximise the potential for the workforce and Proposed Development's supply chain to be sourced locally. These measures would include:

- Working with local people and local business to ensure that, wherever practicable, investment in the South East, stays in the South East.
- Engaging with Jobcentre Plus to ensure local job opportunities are advertised to local unemployed people and identifying opportunities to help people get back into employment through work placements, education and skills training.
- Upskill people working on the Proposed Development, where practicable through experience, training and development programmes.

5.12.2. DISRUPTION TO BUSINESSES AND RESIDENCES

5.12.2.1. Measures will be put in place to reduce disruption to businesses during the construction period. These include:

- Businesses, residents and community facilities who are likely to be impacted during construction will be consulted about access requirements.
- Where construction activities impact on the ability for customers to determine whether or not a business is still open, signage will be erected such as 'Business as Usual signs' to publicise that the business is still open.

5.12.2.2. A Framework CTMP has been produced to reduce effects from construction traffic outlining:

- Construction traffic routing and embargoed routes;
- Types of construction vehicles to be used for different purposes;
- Avoidance of peak commuting hours;
- Site access and designated parking; and
- Management of loading, waste management and abnormal loads.

5.12.2.3. The construction contractor would need to develop these measures so that communication methods are effective during construction.

5.12.2.4. There will be occasions where vehicular access to residential or commercial properties would be needed at different times and in this situation, road plates can be used to bridge the longitudinal excavations to open the carriageway to provide access with full vehicular access being reinstated overnight. This will be determined by the appointed contractor on a case-by-case basis.

5.12.3. DISRUPTION TO COMMUNITY FACILITIES

5.12.3.1. Similar to the mitigation applied above, Community Facilities would be consulted prior to construction where access arrangements would be directly affected. Traffic management systems and diversion routes would be put in place to maintain accessed to identified community facilities.

5.12.3.2. Vehicular access will be maintained at all times to community facilities which perform emergency service activities. Specific measures are outlined in the Traffic Management Strategy and include road plates.

5.12.3.3. Works adjacent to Solent Infant School on Evelegh Road and Mooring Way Infant School, Moorings Way will be programmed within school holidays. The construction programme should be reviewed by the Contractor to see whether it is possible to work within school holidays for other schools near the Order Limits.

5.12.4. EFFECTS ON USERS OF RECREATIONAL AND OPEN SPACE, LEISURE FACILITIES AND PEDESTRIAN ROUTES

5.12.4.1. To ensure that negative effects on amenity value and disruption are reduced as far as practicable during the Construction Stage of the Proposed Development, the following mitigation measures can be implemented:

- The community groups who utilise the areas of recreational and open space which will be impacted by the construction of the Proposed Development would be informed of the nature, timing and duration of particular articular activities during the Construction Stage; and
- If alternative routes or spaces are required to be utilised in and around areas of open and recreational space, directions would be clearly communicated at the appropriate place.

5.12.4.2. The construction programme will be reviewed by the construction contractor(s) to see where there are opportunities to reduce effects on open space, for example by reducing construction programme though concurrent working on single or multiple spaces (including car parks) and avoiding key events. This would also apply to where there may be cumulative effects with North Portsea Island Coastal Flood Defence Scheme at Kendall's Wharf if construction is concurrent. Site liaison would be required to ensure construction site management minimises disturbance in this area.

5.12.4.3. The areas required for longer- term construction works, such as Trenchless methods, within the Order Limits will also be reviewed by the construction contractors to determine whether there are any opportunities to reduce areas of open space required for long-term works. The Applicant will discuss with local authorities and University of Portsmouth opportunities to provide temporary mitigation during periods of disruption, such as where sports pitches are affected, reconfiguring pitches to maximise use of unaffected areas.

5.12.4.4. The Fort Cumberland Road Car Park is currently unsurfaced. As part of reinstatement works following construction, the Applicant will leave the car park in better condition in discussion with PCC.

5.12.4.5. Areas of open space will be restored, as far as practicable, to the same condition as they were in prior to construction.

5.12.5. DISRUPTION TO TOURISM

5.12.5.1. Prior to construction, the Contractor will review the events programme to determine where it may be possible for construction on key transport routes and relevant areas of open space to avoid one-off events. Where this is not possible, the Contractor will liaise with event organisers to implement additional traffic management or other measures to minimise disruption and congestion, such as screening of compounds and provision of security.

5.12.6. EFFECTS ON NON-MOTORISED USERS, RECREATION AND OPEN SPACE

5.12.6.1. The Fort Cumberland Road car park is currently unsurfaced. As part of reinstatement works following construction, the Applicant will resurface the car park. This can encourage better parking and greater capacity use of the remaining car park area.

5.13. WASTE AND MATERIAL RESOURCES

5.13.1.1. All waste will be managed by the Contractor in accordance with the Waste Hierarchy (in order of preference):

- Prevention;
- Minimisation;
- Reuse;
- Recycle;
- Energy recovery; and
- Disposal.

5.13.1.2. The Contractor will be responsible for the correct storage and management of the earthworks material excavated for the works. This material will be used wherever practicable within the Site (as part of the works) to mitigate the environmental effects of the works. The use of recycled materials will be maximised where practicable.

5.13.1.3. Monitoring measures to be adopted across the Proposed Development would include, as a minimum, the implementation of a CEMP, incorporating a Materials Management Plan ('MMP') and Site Waste Management Plan ('SWMP') by the contractor, once appointed. Associated data, information and reports will be used to evidence monitoring undertaken.

5.13.1.4. The SWMP will be prepared in accordance with best practice guidance (Waste and Resource Action Programme ('WRAP')) and will be kept up to date and will be delivered by the Contractor, once appointed. Associated data, information and reports will be used to evidence monitoring undertaken. An Outline SWMP is provided in Appendix 3.

5.13.1.5. The key matters of the SWMP are to:

- Identify the volume of waste streams likely to be produced during the works to establish the potential for reuse and recycling;
- Identify possible options for waste to be 'designed out;
- Identify opportunities for waste minimisation and management;
- Identify the most significant opportunities to increase re-use and recycling rates;
- Identify suitable waste management contractors and record appropriate licences, permits, waste transfer notes and hazardous waste consignment notes;
- Consider appropriate site practices such as how materials will be segregated and the measures that will be used for raising awareness among site operative for waste reduction, reuse and recycling; and
- Set out the method for measuring and auditing Construction, Demolition and Excavation ('CD&E') waste to enable more effective waste management through the setting of performance targets for segregation, recycling and monitoring sub-contractors.

5.13.1.6. The following waste related documentation will be held on-site:

- SWMP;
- Relevant Duty of Care documentation, including waste transfer notes and exemptions;
- A Control of Substances Hazardous to Health ('COSHH') Register; and
- Site compound plan showing potentially contaminative and COSHH substances.

5.13.1.7. The following actions in relation to Material Resources are considered sufficient:

- Completion of ground and local environment inspections and surveys will be undertaken to determine the nature of the ground, to identify its potential to be diverted from landfill.

- Spoil and waste segregation and containment will be provided on temporary laydown areas within the Converter Station Area.
- Sufficient storage space will be allocated by the construction contractor to allow waste to be properly segregated.
- The detailed design and construction aspects will follow British Standard 8895 (Designing for material efficiency in building projects) and other published guidance such as BRE materials resource efficiency in construction.
- Off-site fabrication will be utilised, where practicable.
- The construction contractor will be encouraged, where practicable, to order material with less or returnable packaging.

5.13.1.8. The following further actions are recommended to ensure good and best practice are achieved:

- Identification and specification of material resources that can be acquired responsibly, in accordance with BES 6001 Responsible Sourcing of Construction Products.
- Design for resource optimisation: simplifying layout and form, using standard sizes, balancing cut and fill, maximising the use of renewable materials, and materials with recycled or secondary content.
- Design for off-site construction: Maximising the use of pre-fabricated structures and components, encouraging a process of assembly rather than construction.
- Identify opportunities to minimise the export and import of material resources.
- Detailed design for recovery and reuse: identifying, securing and using material resources at their highest value, whether they already exist on site, or are sourced from other schemes.
- Ensure arisings are properly characterised before or during design, to maximise the potential for highest value reuse.
- Working to a proximity principle, ensuring arisings generated are handled, stored, managed and re-used or recycled as close as practicable to the point of origin.

5.14. CARBON AND CLIMATE CHANGE

5.14.1.1. General mitigation measures for carbon and climate change include:

5.14.2. GREENHOUSE GAS EMISSIONS

5.14.2.1. The Converter Station design will adopt a sustainable approach which will involve the following measures:

- Reducing, where practicable, material use in construction and minimising the use of high carbon materials.
- Buildings should be energy and resource efficient.

Other Construction Measures

- Minimise energy consumption including fuel usage by, for example, reducing the requirement for earth movements to/from and within the construction site;
- Maximise the local sourcing of materials and local waste management facilities, where practicable;
- Use efficient construction processes, such as design for manufacture and assembly; and
- As far as practicable, incorporating material resource efficiency and waste minimisation best practice into design, in particular improving the cut/fill balance of the Proposed Development.

5.14.3. CLIMATE RESILIENCE

Materials:

- Ensuring site and compound drainage infrastructure has sufficient capacity and that silt traps are in use/regularly emptied and maintained.
- Ensure any materials on site are stored safely and covered with waterproof materials.
- Dust control measures would be in place, for example speed limits on site, water available for dampening down, excavated materials to be removed from site as soon as practicable, and backfilling materials installed immediately after delivery.
- Allowing extra time for materials to dry out in the programme of works.
- Using mould inhibiting paint.
- Safe storage of spoil heaps.

Plant and Equipment:

- Using rainwater recycling to support other facilities (e.g. washing of machinery etc.).
- Reviewing wind speed before commencing work at height.
- Ceasing work at height during storms.
- Switching machinery off when not in use.
- Use of machinery which is likely to get hot during cooler periods.

Workforce:

- PPE to be suitable for hot weather conditions, lightweight vests/jackets, two piece rather than coveralls.
- Regular breaks to be taken, additional supply of drinking water and sun cream to be made available.
- Areas of shade to be made available for workforce, where practicable.
- Ensuring welfare facilities are available and sufficiently cool. Ensure rest breaks are taken, particularly during the hottest part of the day (generally, 11am – 3pm) or when temperatures rise above 24^{o}C (TUC , 2019).

Site Compound:

- Storing chemicals, hazardous materials and plant on high ground above projected flood level (see Flood Risk Assessment (document reference 6.3.20.4)) or protecting with bunds/flood barriers.
- Using pumps to ensure water levels in excavations do not exceed critical levels.
- Reducing the area of impermeable surface, where practicable e.g. permeable paving.
- Using vegetation to slow down the movement of surface water e.g. vegetating compound, where practicable, with grass and minimising impermeable area.
- Dust control measures e.g. water spraying, covering spoil heaps.
- Installing lightening protection for site buildings.

Traffic:

- Ensure the access road and roads used during construction are monitored during periods of heavy rainfall and appropriate traffic management put in place to avoid areas of potential flooding.

6. LOCATION SPECIFIC CONSTRUCTION ENVIRONMENTAL CONTROL MEASURES

6.1.1.1. This section of the Onshore Outline CEMP outlines specific environmental management in relation to the construction of the Proposed Development. The structure of this section is broken down into individual route sections.

6.2. GENERAL

6.2.1. ONSHORE ECOLOGY

Winter Restriction of Works Adjacent to Chichester and Langstone Harbour SPA

- Chichester and Langstone Harbour SPA; and
- Wintering Intertidal Birds.

6.2.1.1. Effects of the Construction Stage on Chichester and Langstone Harbour SPA and it's wintering intertidal bird community will be avoided by restricting works within the winter season, defined as October to March (the period when SPA birds such as Brent goose arrive from their breeding grounds; Snow and Perrins, 1998). Details of the working restriction are provided in Appendix 16.14, and comprise 8 principles that will be incorporated into working methods:

- **Principle 1**: Construction works cannot take place in SWBGS (those categorised as either core, primary or secondary) sites that overlap with the Proposed Development's Order Limits during October – March. An exception is the gravel car park, boat yard and linking roadway within site P11 that is already disturbed by movements of cars, lorries and plant, and offers no functional habitat for brent geese or other waterbirds associated with Chichester and Langstone Harbour SPA. Work to establish and dismantle an HDD compound will be undertaken here during this time, but will not involve piling where percussive sounds would disturb birds using the adjacent playing fields.
- **Principle 2**: No buffer zones are applied to SWBGS sites to limit works away from their boundaries, while those sites categorised as 'low use' are also not part of working restrictions.

- **Principle 3**: Where HDD works are to take place underneath the SWBGS site (e.g. at Eastney Landfall) no direct impacts are considered to occur and the restriction does not apply. The following SWBGS sites overlap with the Proposed Developments Order Limits, running from South to North as follows:
  - P25 – University of Portsmouth, Langstone Campus;
  - P23B – University of Portsmouth;
  - P23A – Milton Common north 1;
  - P23R – Milton Common north 2;
  - P11 – Kendalls Wharf playing fields; and
  - P08A – Farlington playing fields.
- **Principle 4**: Elements of the Onshore Cable Route that are over 400 m from the SPA are not included in any restriction.
- **Principle 5**: Construction noise events of <55 dB can occur unrestricted.
- **Principle 6**: Construction works of 55 – 72 dB immediately adjacent to a major road and/or adjacent to industrial sites with notable levels of background noise can be undertaken unrestricted. It is considered that noise levels from the Proposed Development would be masked in these instances.
- **Principle 7**: Regular/consistent construction noise (>70dB) and irregular/sudden construction noise 60-72 dB implies potential for impacts on the more sensitive species e.g. Brent geese and can only occur if effects do not overlap with areas of the SPA identified as supporting this species.
- **Principle 8**: Irregular construction noise (>70dB) that is exposed to the SPA should be restricted during October – March. Vibropiling at HDD 2 and 3 will not be undertaken during the wintering period, with sheet piles inserted prior to the arrival of wintering SPA birds.

6.2.1.2. Adoption of these principles will offset direct effects on SWBGS sites (as these sites will not be subject to works in the winter period when they are used by SPA birds), and effects of noise and vibration on birds within the SPA itself. Additionally, principles mandate that vibropiling associated with HDD sites 2 and 3 will not take place during the period where wintering birds are present, and therefore will not disturb them.

6.2.1.3. To avoid loss of important habitats within the Order Limits, HDD is proposed to avoid the need for open trenching and to preserve habitats. Key locations where HDD will be used are at Kings Pond (HDD-5), between Farlington and Kendall's Wharf (Langstone Harbour) (HDD-3) and at Milton Common (HDD-6). HDD requires

entrance and exit sites and associated construction compounds but for the duration of the drill has no impact on habitats or species above ground.

6.2.1.4. Following construction hedgerow planting will be undertaken to repair gaps where the corridor required their removal. Replanting will use native plant species of local provenance, and will provide a diverse range of woody species to maintain the species-rich nature of hedgerows.

6.2.1.5. Trees, scrub, hedgerows and other nesting bird habitat will be cleared outside of the bird breeding season (March - August), when practicable, to avoid killing or injuring breeding birds or their young.

6.2.1.6. To avoid loss of important habitats within the Order Limits, Horizontal Directional Drilling ('HDD') is proposed to avoid the need for open trenching and to preserve habitats. The locations where HDD will be used are at Kings Pond (HDD-5), between Farlington and Kendall's Wharf (Langstone Harbour) (HDD-3) and at Milton Common (HDD-6). HDD requires entrance and exit sites and associated construction compounds but for the duration of the drill has no impact on habitats or species above ground.

Bats and Lighting

Lighting design for works at Farlington Playing Fields:

6.2.1.7. Lighting of construction work will be designed with reference to recommendations issued by The Bat Conservation Trust (Bat Conservation Trust, 2014) and Institute of Lighting Engineers (Institute of Lighting Engineers, 2009), and be cowled/hooded to avoid extraneous light spill, and focussed onto works areas only to maintain dark corridors on the edge of the playing fields (10 m dark corridor) and avoid disturbance of commuting and foraging bats.

Soil Horizon Preservation

6.2.1.8. Mitigation for temporary loss of grassland will be to maintain soil horizons and preserve grassland turf. Mitigation will be put in place at Kings Pond Meadow SINC, Denmead Meadows, Milton Common SINC and unimproved and semi-improved grasslands along the Onshore Cable Corridor.

6.2.1.9. Although growing vegetation would be lost to trenching work and the installation of construction compounds/access points, removal and preservation of turves so that they can be replaced when work is finished will retain the seed bank within them allowing regrowth. Maintaining soil conditions by maintaining soils structure (turf, top soil, subsoil) will maintain soil conditions for re-growth of meadow vegetation.

6.2.1.10. The following measures will be put in place:

- Separate turves, top soil and sub soil. Each will be stored separately with no mixing during works;
- Replace soil structure following completion of work with turves on top;
- Use low ground pressure machinery also to avoid compaction;
- Works areas will be securely fenced and procedures put in place to prevent damage to grassland habitats adjacent to them (e.g. by the use of herras fencing); and
- Works to be monitored by an Ecological Clerk of Works who will provide toolbox talks to contractors and staff working at the site.

6.2.1.11. At Kings Pond Meadow SINC and Denmead Meadows, where vegetation has a wet meadow character, work will avoid the plant growing season and winter wet season as both these are important for maintaining the conditions within the habitat. Work in this area will be undertaken in late summer/autumn to facilitate this.

Ground Protection

6.2.1.12. Use of bog matting, temporary membranes with Type 1 aggregate or similar ground protection solutions will be used to prevent compaction of grassland soils at:

- Kings Pond Meadow SINC;
- Denmead Meadows;
- Milton Common SINC;
- Unimproved neutral grassland; and
- Semi-improved neutral and calcareous grassland.

6.2.1.13. This mitigation measure will promote regrowth of vegetation to its original state.

6.2.1.14. Ground protection measures apply to the Construction Stage of the Proposed Development. Maintenance will be infrequent, and use light vehicles that would not lead to effects above those of regular use and management of the land as farmland.

6.2.2. ARBORICULTURE

6.2.2.1. The general design principles for working around trees are as follows:

- Adherence to BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS 5837) when laying cables must be adhered to. RPA's must be avoided, where practicable.
- Mitigation of impacts can be achieved by avoiding high value features through considering the use of alternative trenching methods, in accordance with BS 5837:2012, where practicable.

- Where features are to be removed, consideration for replanting with like for like species in the locality may be required. Hedgerow trees may require positioning at least 5 m away from the Onshore Cable Route. Mitigation may also be achieved by appropriate compensatory tree planting within the locality.
- Ground protection would be used where RPA's are encroached upon and it is practicable to retain the relevant feature. For example, use of a no-dig construction for access routes must be employed.
- Onshore Cable Micrositing to minimise impacts to retained arboricultural features approaches to be employed would avoid damage to tree roots when excavating within a RPA.
- Under no circumstances must any works or storage take place within 15 m of ancient woodland. When storing materials, particularly liquids, slopes and drainage channels must be considered to prevent spillages and flow into the buffer zone.
- The Onshore Cable Corridor within the highway is constrained by land ownership, buildings, under and over ground services, street furniture and traffic considerations. Therefore, options for avoiding trees would need to be carefully considered.
- In accordance with the required standoff for overhead and underground cables as shown in the indicative landscape mitigation plans (Figures 15.48 and 15.49 of the ES Volume 2 (document reference 6.2.15.48 and 6.2.15.49)), the use of soft landscape resources such as grass verges, particularly in highway, may limit any future mitigatory tree planting opportunities and may permanently detrimentally affect the local landscape.
- Tree roots are likely to be infrequent within the carriageway construction due to lack of soil available for root growth. However, roots may persist at greater depths where conditions are favourable. Where practical, cable routing in the carriageway would be considered favourable in comparison to areas where ground conditions are likely to result in more prolific root growth.
- Significant tree roots are likely to be frequent within footway, verge areas and other soft landscape areas where trees are present. Works in these areas must be avoided, where practicable.

6.2.3. LANDSCAPE AND VISUAL AMENITY

6.2.3.1. Measures which form an important part of efforts to control Construction Stage impacts on landscape character and visual amenity (Section 1 to 10) include:

- Appropriate location, organisation and phasing of construction activities.
- Maintenance of a tidy and contained site compound to reduce visual clutter.

- Design and layout of site construction areas to reduce adverse impacts arising from temporary security fencing and lighting.
- Measures to control working hours in specific locations to avoid disturbance to residential receptors both in terms of light and noise.
- Agreed site access points to limit impacts on existing vegetation both above and below ground.
- Retention and protection of existing vegetation considering temporary fencing to demarcate the construction footprint refer to BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations, (BSI Standards Publication, 2012 British Standards Limited).
- Onshore Cable Micrositing in addition to trenching to avoid specific features.
- Careful siting of temporary topsoil storage areas considering use as a physical buffer between the construction works and more sensitive receptors, where practicable.
- Careful management and storage of topsoil and subsoil in accordance with Construction Code of Practice for the Sustainable Use of Soil on Construction Sites (Department for Environment, Food and Rural Affairs, 2009).
- Where construction works obstruct a footway an absolute minimum unobstructed width of 1 m would be provided alongside the construction corridor and where this is not possible a safe alternative route. This would include provision of suitable crossing facilities where required, including the temporary replacement of existing pedestrian crossings that may need to be closed to facilitate construction see the Transport Assessment.
- Temporary screening for sensitive visual receptors through implementation of solid construction hoardings whilst using natural existing screens (topsoil and existing vegetation) where practicable. Hoardings would be attractive, used to screen low level “clutter” and reduce noise.
- Hoardings would be well lit in poorly lit walkways and any gates should be positioned to minimise noise transmitted to nearby sensitive receptors.
- Large plant /equipment would be located away from most sensitive receptors where there are viable alternatives.
- Removal of temporary structures and stockpiles when no longer required.

- Prompt reinstatement of temporary construction areas (including trenches, laydown and construction (including haul road) corridor on completion of the cable route installation as soon as practicable after sections of work are complete. Reinstatement would involve the careful handling of soils and a return to the existing habitat type.
- Implementation of mitigation planting alongside the construction programme where works would not affect planting and during winter (November – February).
- Mitigation planting to replace hedgerows and trees lost following completion of the construction works.

6.2.4. AGRICULTURAL SOILS AND LAND USE

6.2.4.1. Within the current design for the Onshore Cable Route, trenches within agricultural land will be excavated to a typical depth of 1300 mm (depth dependent on the existing utilities). The contractor will ensure that topsoil and subsoil resources are kept separate and placed either side of the exposed trenches. The cables ducts will be laid within approximately 400 mm of cement-bound sand and the remainder of the void is to be backfilled with the excavated soil. Priority should be given to full use of the topsoil resource in the reinstatement of soils above the cable: the surplus material should all be subsoil.

6.2.4.2. As stated in Waste and Material Resources above, the current design of the Converter Station seeks to balance cut and fill, and excess material (estimated at 45,325 tonnes) will be available for use in reprofiling the landform, pond fill and screening. Outstanding surplus will be suitable for off-site general or landscaping fill.

6.2.5. GROUNDWATER

6.2.5.1. It is expected that the installation rate for cable ducts for one circuit will be approximately 18 m – 30 m per day and typically in 100 m sections, within urban areas and approximately 50 m per day in open countryside. Any groundwater or rainwater that collects in a trench will be pumped into locations agreed with the landowners, local authorities, EA or drain operators (Portsmouth Water and Highways Authorities). The method of water discharge has yet to be determined.

6.2.5.2. The water management permitting, licenses and agreements will be completed by the appointed contractor, with the quantities of groundwater management determined at the detailed design stage. This applies to all sections. The groundwater collected will either be discharged to surface water, sewer, disposed of off-site or a combination of these three methods. This applies to all sections.

6.2.5.3. If the water is to be discharged to sewer or a surface waterbody then a discharge consent(s) may be required. The permitting process will be completed by the contractor, after detailed design, once a dewatering and discharge management methodology has been agreed upon. This applies to all sections.

6.2.5.4. Should groundwater dewatering be substantial (greater than or equal to 20m^3/day) an abstraction licence and discharge consent will be required from the EA. At present the requirement for a groundwater abstraction for trench installation is unknown, the quantities of groundwater removal will be determined at detailed design stage. The contractor will be responsible for acquiring the relevant consents and adhering to the conditions of said consents. All groundwater abstraction licensing and discharge permits will not be disapplied but obtained during the detailed Design Stage, as agreed upon with the EA.

HDD Groundwater Level and Flow

6.2.5.5. To ensure drilling fluids do not break out into the groundwater environment nor groundwater seeps into the bore, a mud engineer will be present at all times during the HDD drilling process to monitor drilling fluid viscosity, density, annual pressure, solids contents, filter cake quality and total mud volume and thereby ensuring the filter cake remains intact and that drilling fluid is not lost to the ground and that groundwater does not seep into the bore annulus.

6.2.5.6. Drilling fluid losses to groundwater can occur in high permeability ground materials. Where these conditions are to be encountered the drilling contractors will need to monitor the fluid pressures and observe for pressure drops. When a significant pressure drop occurs, losses maybe occurring. To stop drilling fluid loss a number of actions can be taken to seal the area of loss, for example increasing the drilling fluid viscosity or introducing a cement grout. Real time downhole annular pressure monitoring should be completed to allow for these observations.

6.2.5.7. If any fluid loss occurs works will halt immediately to allow drilling fluid reconfiguration.

6.2.5.8. HDD-5 (Kings Pond) will be installed within the Lambeth Group geology to avoid the Chalk. This will therefore ensure the HDD alignment avoids the Chalk karst features. Karst features can be present in ground materials overlying the Chalk and if any voided overburden is encountered, drilling fluid control measures will be implemented to prevent drilling fluid losses. The contractor will ensure that when drilling HDD-5 there will be at least a 5m standoff between the proposed HDD alignment and the Chalk at all times.

6.2.5.9. The launch and receptor pits for the HDD-4 (Farlington Railway Crossing (Trenchless)) will include perimeter sheet piled walls toed into the Chalk to reduce groundwater ingress from the superficial River Terrace Deposits. Groundwater seepage at the base of the pits could occur and this will be sump pumped during operation. The potential consents and permits required to manage this water will be completed by the appointed contractor. The method of discharge has yet to be determined. The groundwater collected will either be discharged to surface water, sewer, disposed of off-site or a combination of these three methods. If the water is to be discharged to sewer or a surface waterbody then a discharge consent(s) may be

required. The permitting process will be completed by the contractor, after detailed design, once a dewatering and discharge management methodology has been agreed upon. The appointed contractor will be responsible for acquiring the relevant consents and adhering to the conditions of said consents. Any contaminated water would require off-site disposal.

6.2.5.10. The required groundwater dewatering quantities for HDD-4 pits will be determined at detailed design. The designer must ensure the discharge quantities are accurate or conservative to ensure no flood risk should be increased due to surplus groundwater encountered during construction.

HDD Groundwater Quality

6.2.5.11. All drilling equipment will be checked and cleaned before use. This will prevent cross contamination. A review of the drilling fluid and inert polymers will also be completed before ground is broken. All drilling fluids, including polymers, will be Cefas rated.

6.2.5.12. Drilling through alternative geologies can transfer existing contamination from one source to another. Drilling can also generate fines which can increase sediment in the water column, creating turbidity contamination. The Filter Cake will prevent the mobilisation of contaminants from one groundwater body to another, as the cake 'self-seals' as the drilling progresses. Therefore, no cross contamination is anticipated. Following the embedded mitigation measures the drilling fines and fluids will be contained in the drilling cake, preventing contamination from spreading between sources and drilling fines entering the local groundwater receptors.

6.2.5.13. To ensure surface breakout is not lost to the environment a flexible hose pump will be contained at the exit compound site so breakout fluid can be retained on site. A sufficiently sized Intermediate Bulk Container or similar will be stored on site to store such a breakout.

6.2.6. SURFACE WATER RESOURCES AND FLOOD RISK

Surface Water Drainage Patterns

6.2.6.1. A number of Main River and Ordinary Watercourse crossings are located within the Order Limits, as detailed within Table 6.1. To limit the impact to the surface water environment alongside other environmental and design constraints it is proposed to pass under a number of these open channel watercourses using HDD or Trenchless techniques to pass under the watercourses open channel. HDD / Trenchless techniques are proposed at:

- Kings Pond (HDD) (Soake Farm - Main River) – HDD-5;
- Farlington Railway Crossing (Trenchless) (Farlington Marshes Gutter - Ordinary Watercourse) – HDD-4; and

- Langstone Harbour (HDD) (Broom Channel - Transitional/ Tidal Watercourse) – HDD-3.

6.2.6.2. Thereafter the other Main Rivers and Ordinary Watercourses identified at this stage, as detailed within Table 6.1, are proposed to be crossed within the public highway where the watercourses are confined to a culvert, and works within the cable corridor will not impact on the watercourses drainage patterns.

Water Supply and Surface Water Wastewater Infrastructure – Quantity

6.2.6.3. During construction it is proposed that any temporary requirements for water supply and foul wastewater throughout the Order Limits are likely to be provided through temporary site compounds and construction set up that would not utilise the existing local networks.

6.2.6.4. Notwithstanding the above, an in-principle connection agreement with Portsmouth Water has been obtained for the proposed permanent connection for the Converter Station Area with agreement for temporary use during construction, if required, subject to detailed design and to be determined by the appointed contractor. This in-principal agreement is for a connection point at Broadway Lane, and has been obtained from Portsmouth Water for an assumed demand requirement of 105 'loading units' based on Portsmouth Waters application for water supply calculations.

6.2.6.5. Any changes to the assumed demand and construction demand shall be agreed with Portsmouth Water prior to connection, with the contractor responsible to account for any head loss when sizing the supply.

6.2.6.6. If the contractor determines, during detailed design, that it would be appropriate to utilise a local water infrastructure network throughout the Onshore Cable Corridor, the anticipated quantities are likely to be variable depending on its specific use. Furthermore, a proposed temporary connection for either clean water supply, surface water and foul water discharge would be subject to approval from Portsmouth Water (clean water supply) and Southern Water (wastewater).

Surface Water Features Water Quality

6.2.6.7. The Proposed Development and associated works are proposed to avoid disruption to the Main Rivers and Ordinary Watercourses (Table 6.1) located within the Order Limits by ensuring that all installed ducts and trenching across watercourses are undertaken within the highway carriageway. By remaining within the carriageway any existing watercourses are expected to pass under the carriageway within a watercourse structure (e.g. culvert or sewer).

6.2.6.8. Where open channel watercourses are present within the Order Limits, it is proposed to use HDD or Trenchless techniques to pass under the watercourses open channel.

Human Receptors and Infrastructure as a Consequence of Flood Risk

6.2.6.9. The Converter Station Area is located on high ground and away from any watercourse and is located within Flood Zone 1.

6.2.6.10. Proposed watercourse crossings are proposed to be via HDD/ Trenchless techniques or within the carriageway around a watercourse structure (culvert or sewer).

6.2.6.11. Works adjacent within the Onshore Cable Corridor adjacent to the coastal flood defences have been developed alongside consultation with East Solent Coastal Partnership ('ESCP') where it has been agreed in principle that the design will void works to existing or proposed coastal flood defence alignments. Furthermore, the proposed HDD under Broom Channel (Langstone Harbour HDD-3) is proposed to pass below or avoid any sheet piling associated to the coastal flood defence.

6.2.6.12. It should be noted that the implementation of above principles will be the responsibility of the appointed contractor to develop during detailed design and be subject to relevant environmental consents prior to construction.

Table 6.1 – Summary of Watercourses within the Order Limits

Code	Watercourse Name	Classification	Typical Form with Onshore Order Limit	Structures within Onshore Order Limit	Proposed Watercourse Crossing	Water Environment Consent Regulator	Overview
WC.01	Soake Farm North	Main River	Open channel*	None	No	EA	No proposed crossing
WC.02	Soake Farm South	Main River	Open channel	None	Yes	EA	Proposed to horizontal directional drill under watercourse
WC.03	Unnamed	Ordinary Watercourse	Open channel/ culvert	Culvert	Yes	SW, LLFA	Proposed crossing culvert within carriageway build up
WC.04	Old Park Farm	Main River	Culvert	Twin culvert	Yes	SW, LLFA, EA	Proposed crossing culvert within

Code	Watercourse Name	Classification	Typical Form with Onshore Order Limit	Structures within Onshore Order Limit	Proposed Watercourse Crossing	Water Environment Consent Regulator	Overview
							carriageway build up
WC.05	Unnamed	Ordinary Watercourse	Culvert	Culvert	Yes	SW, LLFA	Proposed crossing culvert within carriageway build up
WC.06	Unnamed	Ordinary Watercourse	Culvert	Box Culvert	Yes	SW, LLFA	Proposed crossing culvert within carriageway build up
WC.07	Unnamed	Ordinary Watercourse	Swales*	None	No	LLFA	No proposed crossing
WC.08	Unnamed	Ordinary Watercourse	Culvert	Culvert	Yes	SW, LLFA	Proposed crossing culvert

Code	Watercourse Name	Classification	Typical Form with Onshore Order Limit	Structures within Onshore Order Limit	Proposed Watercourse Crossing	Water Environment Consent Regulator	Overview
							within carriageway build up
WC.09	North Purbrook Heath (North)	Main River	Culvert	Twin box culvert	Yes	EA	Proposed crossing culvert within carriageway build up
WC.10	North Purbrook Heath (South)	Main River	Open channel	None	No	EA	No proposed crossing
WC.11	Unnamed	Ordinary Watercourse	Open channel	None	Yes	LLFA	Proposed Trenchless techniques under watercourse

Code	Watercourse Name	Classification	Typical Form with Onshore Order Limit	Structures within Onshore Order Limit	Proposed Watercourse Crossing	Water Environment Consent Regulator	Overview
WC.12	Farlington Marshes Gutter	Main River	Open channel	None	No	EA	No proposed crossing
WC.13	Broom Channel	Main River	Channel	None	Yes	EA, HE, ESCP	Proposed horizontal directional drill under watercourse and defences
WC.14	Great Salterns Drain	Main River	Culvert	Culvert	Yes	EA, HE, ESCP	Proposed crossing culvert within carriageway build up

6.2.6.13. Land affected by open trenching will be reinstated with native soil and or surfacing, typically with no infrastructure left above ground.

6.2.6.14. The only proposed infrastructure outside the Converter Station Area above ground includes boxes/ pillars associated with the intermediate and transition joint bays and the two ORS' at Section 10 - Eastney (Landfall) that will be positioned at some location within the Onshore Cable Corridor which is to be determined as part of the detailed design, post-DCO Application.

6.2.7. NOISE AND VIBRATION

Environmental Control Measures to be employed for specific activities

Trenching

6.2.7.1. The majority of duct laying activities via trenching are expected to take place during weekdays between the hours of 07:00 and 17:00 and Saturdays from 08:00 to 13:00 hours. Due to the transient nature of the duct laying works, and the substantial space constraints anticipated, noise mitigation in the form of screening is unlikely to be feasible.

6.2.7.2. However, there are some locations where trenching is expected to take place outside of conventional working hours (i.e. during evenings, weekends and at night-time) to mitigate negative traffic effects on the surrounding road network. The out of hours working locations are as follows:

1. Section 4 – a c.90m section of the A3 London Road in Purbrook near Stakes Road;
2. Section 5 – Havant Road between Farlington Avenue and Eastern Road;
3. Section 6 – Fitzherbert Road and Sainsbury's Car Park; and
4. Section 8 – Eastern Road between Airport Service Road and north of Milton Common (c. 350m south of Tangier Road).

6.2.7.3. For further information, see the Framework CTMP (document reference 6.3.22.2).

6.2.7.4. The following mitigation measures should be employed during the out-of-hours trenching works:

All out-of-hour locations

6.2.7.5. Mitigation for out-of-hours trenching works includes the incorporation of screening expected to achieve 5 dB attenuation. The exact form that this screening would take is unknown at this stage. It could, for example, comprise solid (e.g. timber) 2 m high site hoarding around the construction works. Alternatively, if this is not possible due to time or space constraints, Heras fencing around the compounds will be fitted with acoustic quilts, and combined with further localised screening of particularly noisy equipment items. Acoustic quilts must be fitted to fencing with no gaps underneath or between the panels. Screening is considered an important mitigation measure at

these locations because of receptors being more sensitive to noise during the night-time period when stricter criteria apply. Completing works in these areas as quickly as possible to minimise the duration of residents' exposure to high noise levels, whilst minimising the duration of works during the most sensitive periods (i.e. night-time).

6.2.7.6. For night-time works, identifying if negatively affected dwellings have sleeping accommodation at the opposite façade to that affected by construction activity, as noise levels at these facades should be substantially lower than those predicted.

Section 4

6.2.7.7. Aim to complete duct laying for each circuit over two weekends (4 weekends in total). It is most likely that each circuit would be completed in two c.45m sections, one per weekend. At this stage, it has not been confirmed if these would be consecutive weekends. However, completing the works across non-consecutive weekends would reduce negative noise impacts through respite periods.

6.2.7.8. Work will be completed between 07:00 hours and 22:00 hours on Saturday and Sunday.

6.2.7.9. Whilst there would be two further weekends required for the installation of the second circuit, there will be a sufficient temporal gap between these two periods of work.

Section 5

6.2.7.10. There are three potential options for the out-of-hours works in section 5:

- Option 1 – Works for each circuit could be completed in a single weekend. Works would commence at sunrise on Saturday morning and continue until sunset on the Sunday evening. Whilst this would include night-time working on Saturday, the noisiest activities (road cutting/breaking and re-surfacing) will be avoided at night to minimise sleep disturbance in the immediate area.
- Option 2 – Works for each circuit could be completed in two consecutive weekends during the daytime and evening (from 07:00 to 22:00 hours).
- Option 3 – Works for each circuit could be completed in two non-consecutive weekends during the daytime and evening (from 07:00 to 22:00 hours).

6.2.7.11. Two further weekends (or a single weekend with night-time working) would be required for the installation of the second cable circuit, but there will be a sufficient temporal gap between these two periods of work.

6.2.7.12. Whilst it has not yet been confirmed which option would be chosen, avoiding night-time working, and/or completing the works across non-consecutive weekends would reduce negative noise impacts.

Section 6

6.2.7.13. The installation of the cable ducts along Fitzherbert Road, Sainsbury's car park and associated access road may need to take place at night to minimise disruption to the supermarket.

6.2.7.14. The noisiest activities (road cutting/breaking and re-surfacing) will be avoided during hours of darkness to minimise sleep disturbance in the immediate area.

Section 8

6.2.7.15. In order to minimise traffic disruption, 24-hour working seven days per week may be undertaken.

6.2.7.16. Noisiest activities (road cutting/breaking and re-surfacing) will be avoided outside the Harbourside Caravan Park during the hours of darkness to minimise sleep disturbance.

6.2.7.17. If it were possible to complete the approximately 300 m section of trenching on Eastern Road from the north of the Caravan Park to Burrfields Road during weekday daytimes (07:00 to 19:00 hours), noise impacts would be reduced.

6.2.7.18. Until a contractor is appointed, and detailed work plans are produced, it is not feasible to identify further specific physical mitigation measures that could be employed. However, the contractor appointed will engage with local residents affected by the works and the environmental health department at the local planning authorities to agree additional mitigation to reduce the significant effects as far as reasonably practicable.

Joint Bays

6.2.7.19. Mitigation for Joint Bays which are predicted to have any more than a negligible impact at surrounding receptors will be in the form of screening expected to achieve 5 dB attenuation. Generally, Joint Bays located in rural areas distant from sensitive receptors would not require screening, whereas those in more urban areas in close proximity to sensitive receptors would require screening.

HDD sites

6.2.7.20. Screening expected to achieve 5 dB attenuation has been assumed where HDD works are predicted to have more than a negligible impact at surrounding receptors. As work associated with HDD compounds will be scheduled for longer relative to trenching and Joint Bay activities, it is assumed that this screening would take the form of solid (e.g. timber) hoarding around the HDD compounds.

6.2.7.21. At HDD-1 (Landfall) and HDD-5 (Kings Pond), hoarding around the HDD compound is required to be at least 2m high. At HDD-2 (Eastney and Milton Allotments), hoarding around the compound is required to be approximately 3.5m high, to provide sufficient mitigation to the Thatched House public house.

6.2.7.22. At HDD-3 (Portsea Island), HDD-4 (Railway), and HDD-6 (Milton Common), there are no high sensitivity receptors within 100 m of the HDD compounds, and therefore solid site hoarding is not considered necessary at these sites.

6.2.8. SOCIO-ECONOMICS

6.2.8.1. HDD will be used at Landfall, Eastney and Milton Allotments/ Milton Locks Nature Reserve and Milton Common. This avoids direct impacts on Eastney Beach, the Allotments and Milton Locks Nature Reserve.

6.2.8.2. Where the Onshore Cable Corridor crosses open space, the Onshore Cable Route would be designed to avoid key recreational facilities, wherever practicable. This includes avoiding:

- Farlington Playing Fields cricket squares;
- Baffins Milton Rovers football pitch (although training areas are affected); and
- Bransbury Park football pitch, skate park and footway.

6.2.8.3. Where the Order Limits are crossed by off-road PRoW or Cycle route, there is the potential for the route to be closed temporarily during construction for safety purposes. To mitigate this disruption, an alternative route will be provided along with signage in advance of the temporary closure.

6.2.8.4. The Transport Assessment also sets out principles for mitigation, including:

- Traffic Management to keep one lane open including temporary traffic signals on single carriageways and lane closures on wider roads including dual carriageways;
- Access to residences, businesses and community facilities - including access to driveways outside working hours and three-way signals for business premises with their own access onto affected highways; and maintenance of side road access;
- A communication strategy to allow stakeholders such as residents, businesses and community facilities to keep up to date with construction works;
- Access principles for pedestrians and cyclists; public transport; school access; and emergency services; and
- Programme constraints, taking into consideration major events.

Disruption to Residences and Local Businesses

6.2.8.5. Overall, residential and business access will be maintained, wherever practicable, albeit with different traffic management approaches applied depending upon the circumstances as described in the Transport Strategy.

6.2.8.6. Along the majority of the roads within the Order Limits, a single lane will remain open to traffic and access will be maintained for cyclists and pedestrians at all times. Pedestrian and cycle routes along the Onshore Cable Corridor will be maintained wherever practicable, with full closure considered as the last resort, such as where it would prevent full closure of a major road. In all cases the construction works will ensure that pedestrians and cyclists can pass the corridor in a safe manner, with suitable barriers between the construction works.

6.2.8.7. Access to junctions with roads affected by the Order Limits, business premises and retail parks will be maintained using three-way traffic lights.

Disruption to Community Facilities

6.2.8.8. As set out in the Transport Strategy, to avoid disturbance to schools, construction of the Cable Corridor will not take place outside of the school holidays where they there are schools located directly adjacent to the Onshore Cable corridor. These include:

- Solent Junior School on Solent Road and Solent Infant School on Evelegh Road, adjacent to Farlington Avenue; and
- Mooring Way Infant School, Moorings Way.

6.2.8.9. The Transport Strategy also includes measures to continue to provide access to emergency services adjacent to the Order Limits.

Effects on Users of Recreation, Leisure Facilities and Open Space and Non-Motorised User Routes

6.2.8.10. It is anticipated that seven PRoW are severed by the Onshore Cable Corridor, which would need to be temporarily diverted for health and safety purposes. The PRoW are listed below:

- PRoW 4 – Section 1, farm track between Broadway Farm and Little Denmead Farm;
- PRoW 41 – Section 2, bridleway between Anmore Road and Edney Lane; and
- PRoW 11– Section 4, starting at Maurepas Way;
- PRoW 17 – Section 4, located along Milk Lane;
- PRoW 24 – a short length of footpath connecting Drayton Lane and the B2177 to the south west of the Order Limits for the Proposed Development;
- PRoW 31 – Section 5, a small section of footpath which provides a link between Eastern Road and Copsey Grove; and
- PRoW 33 – Section 6, Zetland Fields.

6.2.8.11. Additionally, there are four Long Distance Walking Routes (Monarchs Way in Section 1, Wayfarers Walk in Section 3- 4, The Solent Way in Sections 7-10, and Shipwrights Way in Section 10) within Order Limits. It is anticipated that the construction of the Onshore Cable Route is also likely to directly severe these routes which will require temporary diversions to be implemented. The Transport Assessment programmes work outside key periods, such as including December for Christmas Shopping and Festivals season on Farlington Playing Fields.

6.2.9. HUMAN HEALTH

- Cable ducts allow short sections to be worked on at any one time. The installation rate for cable ducts will be approximately 18 m - 30 m per day on average within urban areas and approximately 50 m per day for areas of open land. This will minimise the duration of disruption;
- Joint Bays will be positioned in highway verges, fields or car parks, where practicable, to limit the need for road closures;
- Temporary fencing will be used to secure the areas under construction during the construction works;
- Apart from the entry and exit points of the HDD, there will be no impact on the areas in between, including Eastney Beach, the Eastney and Milton Allotments and Milton Locks Nature Reserve;
- Where the Onshore Cable Corridor crosses greenspace, the route has been designed to avoid key recreational facilities, wherever practicable;
- Public activities and events that are planned in proximity to the Proposed Development will be taken into consideration during the phasing of the of construction works along the Onshore Cable Route; and
- To minimise disruption, a single lane closure would be used, where practicable, rather than a full road closure. Road closures (70 m distance in total) are anticipated at:
    - Broadway Lane (one days per circuit, two days total);
    - Anmore Road (one day to two weeks);
    - A3 London Road between Poppy Fields and Ladybridge Roundabout (one weekend for both circuits);
    - Farlington Avenue between Sea View Road and Solent Road (one - two weeks for both circuits);
    - Farlington Avenue between Solent Road and Havant Road (one - two weeks for one or both circuits, therefore up to two – four weeks for both circuits);

- Evelegh Road (one - two weeks for one circuit, therefore three - four weeks total);
- The entirety of Yeo Court within Section 9;
- Havant Road between Farlington Avenue and Waterworks Road (one - two days for one circuit, therefore up to four days total);
- Eastern Avenue (two - three weeks per circuit, therefore four - six weeks for both circuits);
- Furze Lane Bus Link (two weeks); and
- Yeo Court (one week per circuit therefore up to two weeks).

- Where construction works do obstruct a footway an absolute minimum unobstructed width of 1.0 m will be provided alongside the construction corridor and where this is not possible a safe alternative route will be provided. This will include provision of suitable crossing facilities where required, including the temporary replacement of existing pedestrian crossings that may need to be closed to facilitate construction.
- During construction of the Onshore Cable Route. Where existing bus stops need to be closed, a temporary bus stop will be provided as close as practicable to the original location, taking into account highway safety of all road users.
- While residents will be informed of construction works and encouraged to make alternative arrangements where practicable, such as parking on-street, steel plating over the trench will be available during working hours in the case of emergencies. Outside of these times road plates will be installed and construction fences removed to allow access over the construction zone. Where the construction zone falls on the opposite side of the carriageway to driveways access will be maintained at all times, but drivers will be made aware of construction works/traffic signal control, as appropriate.
- Access to business premises will be maintained using either three-way traffic signals, with excavation of the trench taking place in two phases to allow a 3 m access to be maintained at all times, or through use of road plates.

6.2.9.1. It is expected that there will be a programme of community liaison to ensure that the potentially effected receptors are provided with early warning of construction activities (including targeted leafleting at affected properties and community facilities). Signage and advanced warning will be provided in advance of the temporary closure. Any diversions will be suitable to accommodate all users.

6.3. SECTION 1 – LOVEDEAN (CONVERTER STATION AREA)

6.3.1. WASTE AND MATERIAL RESOURCES

6.3.1.1. The design of the converter station will seek to balance cut and fill of excavated earthworks in order to minimise the quantity of imported earthwork material and to maximise re-use of arisings. Based on the preliminary design, there is a surplus of 45,325 tonnes of material generated.

6.3.2. LANDSCAPE AND VISUAL

6.3.2.1. The Proposed Development will be constructed in line with a suite of Design Principles (which include landscape design principles) and an Outline Landscape and Biodiversity Strategy which will be approved by the LPAs. The Outline Strategy will be prepared in accordance with the outline Strategy. The Outline Strategy will include detailed landscape mitigation plans reflecting the indicative landscape mitigation plans, together with management, maintenance and monitoring plans.

6.3.2.2. The Outline Landscape and Biodiversity Strategy requires the implementation of mitigation planting alongside the construction programme where works would not affect planting and during winter (November – February) (document reference 6.3.15.7).

6.3.3. ONSHORE ECOLOGY

6.3.3.1. The Proposed Development has incorporated a 15m buffer between works and Stoneacre Copse, Crabden's Copse and Crabden's Row to avoid direct effects on this feature. No ancient woodland is present within the Order Limits.

6.3.3.2. Landscape planting around the Converter Station will incorporate ecologically important habitats to offset those lost due to construction work. Planting will include mixed woodland, scrub, hedgerow, scattered trees and marshy grassland associated with flood attenuation features. Sections of hedgerows removed to accommodate the installation of the Onshore Cable Route will be replanted. These planting measures are designed to enhance biodiversity within the Converter Station Area, and will replace grassland which has developed on arable land that is no longer farmed.

Improvement of remaining calcareous grassland at Lovedean

6.3.3.3. At the Converter Station the botanical diversity of the semi-improved calcareous grassland will be improved by application of green hay. Green hay contains seed from a diversity of wildflower species and will inoculate retained grassland at Lovedean with new flora. The green hay will be sourced from Denmead Meadows to ensure native plants of local provenance are used to colonise and increase the value of the grassland.

6.3.3.4. Improvement using green hay will take place in late spring (June-July) in the year following completion of construction work.

Closure of Badger setts under licence

6.3.3.5. The two badger setts to be lost to the converter station footprint (option B(i)) will be closed using badger gates outside of the badger breeding season (June-November inclusive).

6.3.3.6. Setts will be closed using one-way gates so badgers can leave but cannot return to the sett. Following a period of monitoring to ensure badgers are not within them, the setts will be dug out.

6.3.3.7. This process will avoid potential death or injury to badgers as a result of development, and work will be undertaken under a Natural England licence to allow legal sett closure.

6.3.3.8. In addition, open excavations will be fitted with mammal ladders (planks of wood at either end) to allow animals to climb out if they fall in, and prevent the trapping of animals including badgers.

6.3.4. ARBORICULTURE

6.3.4.1. Where practicable design would avoid positioning cables in conflict with RPAs of existing trees. Where significant incursion is unavoidable, trees would be appropriately replaced.

6.3.4.2. Hedge removal in the Converter Station would be minimised by only removing what is required to lay the Access Road. For example, if the Access Road is 7.5 m wide only 8.5-9.5 m of each hedge is required for removal. Also, where the Access Road is laid as a 2-way road, hedges can provide pinch points and reducing traffic flow to a single lane. Mitigation for the loss of hedgerows and hedgerow trees will be replaced with like for like species, where practicable, with hedgerow trees repositioned at least 5 m away from the Onshore Cable Route.

6.3.4.3. In line with the proposed Arboricultural Method Statement (see Appendix F of the Arboriculture Report (document reference 6.3.16.3)). The process of construction of the Converter Station shall minimise encroachment on the west side of the Converter Station where practicable.

6.3.4.4. Works Compound and Laydown Area would be prohibited within 15 m of the ancient woodland and hedgerows. When storing materials, particularly liquids, slopes and drainage channels would be used to prevent spillages and flow into the buffer zone of the ancient woodland and hedgerows.

6.3.5. TEMPORARY SURFACE WATER MANAGEMENT

6.3.5.1. The appointed contractor is to take all steps necessary to avoid cross contamination and shall use appropriate water management techniques during the ground work.

6.3.5.2. The appointed contractor is required to clean all equipment used in the construction before repositioning the equipment. Waste-water must not be allowed to enter natural water bodies or intrusive locations. Waste-water should not enter drains or sewers without prior authorisation. The appointed contractor is to liaise with the employer and EA to obtain such authorisation. Waste material must not be carried out onto public land (e.g. on wheels of site vehicles). All equipment used in the construction shall be cleaned before leaving site.

6.3.5.3. For any further site Investigation Aquifer protection measures shall be put in-place throughout the works. Works shall be undertaken in accordance with Environmental Agency guidance as outlined in “Technical Report P5-065/TR)”.

6.3.5.4. Construction of the Converter Station would require levelling the site and the excavation of the foundations for the building and equipment. A temporary low permeable construction compound will also be needed to house the heavy vehicles and construction works.

6.3.5.5. The excavation of the foundations and levelling of the site is likely to change the natural hydrological characteristics of the site potentially increasing the surface water flood risk. The flood risk also has the potential to increase due to the low permeable construction area which is likely to temporarily increase runoff to the surrounding land and drainage networks.

6.3.5.6. Activities on site during construction could lead to an increase in turbid run-off and spillage/leaks of fuel, oil, etc. That could affect aquifer through surface water runoff. However, the construction process would include mitigation measures to intercept run-off and ensure that discharge from the site are controlled in quality and volume. This may include the use of settling tanks or ponds to remove sediment, temporary interceptors and hydraulic brake.

6.3.5.7. The construction methodologies will ensure the risk of flooding and contamination is not increased during development through the use of surface water run-off management strategies.

6.3.5.8. In addition, construction phase pollution prevention measures will be required and will be designed and implemented by the appointed contractor with reference to the documents highlighted within reference section of this report (Note: List is not exhaustive).

6.3.5.9. Due to the above requirements it is proposed that a Temporary Site Water Management Plan is developed and submitted to the EA, Portsmouth Water and Hampshire Country Council for approval prior to commencement of construction work by appointed contractor.

6.3.5.10. This plan will be in addition to, or in support of other construction phase licences and permissions which may be contractor led.

To Summarise:

6.3.5.11. All construction work would be undertaken in accordance with guidance and the measures outlined in this Onshore Outline CEMP, which would in turn inform the detailed CEMP to be produced by the appointed contractor prior to construction. Current Guidance includes:

- Environmental Agency, Pollution Prevention Guidance Note 6 (PPG6): Pollution Prevention Guidelines – Working at Construction and Demolition Sites;
- Environmental Agency, Pollution Prevention Guidance Note 5 (PPG5): Working in, near or liable affect watercourses;
- Control of Water Pollution in form Construction Sites – Guidance for Consultants and Contractors CIRIA (C650); CIRIA – SuDS Manual;
- Prevent surface water being affected during earthwork operations. No discharge to surface watercourses will occur without permission from EA (SuDS Manual);
- Wheel washers and dust depression measures to be used as appropriate to prevent the migration of pollutants (SuDS Manual);
- Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual);
- A construction method statement to be submitted for approval by the responsible authority (SuDS Manual); and
- All other relevant good industry practice guides and all UK statutory legislation.

6.3.5.12. Although localised contamination of soil may occur during construction as a result of leaks or spills of fuels, oils and chemicals, the potential for contamination to occur will be reduced by implementing the following pollution mitigation measures:

- Refuelling of machinery would be undertaken within designated areas where spillages can be easily contained. Machinery would be routinely checked to ensure it is in good working condition;
- Any tanks and associated pipe work containing hazardous substances would be double skinned and be provided with intermediate leak detection equipment;
- The following specific mitigation measures for the protection of surface water during construction activities would be implemented:
    - Management of construction works to comply with the necessary standards and consent conditions as identified by the EA, PW and HCC;

- Provide appropriate spill kits on the construction site and laydown areas and provide training and briefing for all staff highlighting the importance of water quality, the location of watercourses and pollution prevention included within the site induction;
- Area with prevalent run-off to be identified and drainage actively managed, e.g. through bunding and/or temporary drainage;
- Area at risk of spillage, such as vehicle maintenance areas and hazardous substances stores (including fuel, oils, and chemicals) to be bunded and carefully sited to minimise the risk of hazardous substances entering the drainage system to the local watercourses, additionally the bunded areas will have impermeable base to limit the potential for migration of contaminants into ground;
- following any leakage/spillage. Bunds used to store fuel, oil etc. to have 110% capacity of the volume of fuel, oil, etc. to be stored;
- Excavated material to be placed in such a way as to avoid any spillage with potential contamination of aquifer;
- All plant machinery and vehicles to be maintained in a good condition to reduce the risk of fuel leaks;
- Temporary drainage works to be constructed to relevant statutory guidance and approved via Lead Local Flood Authority prior to commencement of construction;
- Consultation with the EA to be ongoing throughout the construction period to promote best practice and to implement proposed mitigation measures; and
- Appropriate site operational protocols and procedures to be implemented at all times by the site operator over the full operational life of the Site.

6.3.6. HUMAN HEALTH

6.3.6.1. Landscaping (including reprofiling if/where appropriate and associated planting) is proposed around the perimeter of the Converter Station Area and other necessary/appropriate locations to mitigate against the Landscape and Visual Amenity impacts and integrate the Converter Station into its surroundings.

6.3.6.2. Permanent fencing will be provided around the Converter Station, FOC Infrastructure, and anywhere else it is needed for the life of the Proposed Development.

6.4. SECTION 2 – ANMORE AND SECTION 3 – DENMEAD/KINGS POND MEADOW

6.4.1. ONSHORE ECOLOGY

Seed Harvesting and Reseeding

- Denmead Meadows;
- Kings Pond Meadow SINC; and
- Unimproved Neutral Grassland.

6.4.1.1. In addition to soil horizon preservation and ground protection, where particularly sensitive Habitats of Principal Importance ('HPI')-quality Lowland Meadow habitat is present at Denmead Meadows, regrowth will be promoted by collecting seed from plants already present and reseeding using this collected seed following work. This will preserve the local mixture if meadowland plants unique to Denmead Meadows.

6.4.1.2. Using a specialist contractor, a seed harvester will be used to collect seed in the year prior to the onset of works. Seed will be dried and stored until work is complete.

6.4.1.3. Two seed collection sweeps will be undertaken, one in late June/Early July to catch early flowering plants and one in late August/early September for late flowering plants.

6.4.1.4. Re-seeding will take place using collected seed in spring following the completion of construction works.

6.4.2. ARBORICULTURE AND LANDSCAPE

6.4.2.1. Mitigation of impacts can be achieved by avoiding higher value features where practicable including trees subject to TPOs. Where features are to be removed, consideration for replanting in the locality is required.

6.4.2.2. Sections of hedgerows and hedgerow trees where lost will be replaced with like for like species where practicable in agreement with the LPA, with hedgerow trees repositioned at least 5 m away from the Onshore Cable Route.

6.4.3. GROUNDWATER

6.4.3.1. Trenching in Section 2 and Section 3, in the vicinity of the Kings Pond and Denmead Meadows, will avoid the wet winter season. The trenches will be installed at end of the summer to ensure groundwater is at its lowest elevation. If the trenches were to be installed during the peak winter months, groundwater dewatering would likely be required, and this could potentially impact upon Kings Pond which is considered to have a proportion of groundwater dependency. This applies to Sections 2 and 3.

6.4.3.2. The required groundwater dewatering quantities for trench construction will be determined at detailed design. The designer must ensure the discharge quantities are accurate or conservative to ensure no flood risk should be increased due to surplus groundwater encountered during construction. This applies to all sections.

6.5. SECTION 4 – HAMBLEDON ROAD TO FARLINGTON AVENUE

6.5.1. ARBORICULTURE AND LANDSCAPE

6.5.1.1. Detailed design of the Onshore Cable Route and detailed analysis of impacts would be required as the route is refined through Onshore Cable Micrositing overseen by a suitability qualified clerk of works. All works must be carried out where practicable within the carriageway, avoiding the use of footways or verges to minimise impacts on structural roots.

6.5.1.2. High and medium value features including trees subject to TPOs should be avoided where practicable, and design and construction should follow BS 5837 as a minimum.

6.5.1.3. Design must seek to avoid positioning cables in conflict with RPAs of existing trees. Where significant incursion is unavoidable, consideration for replanting in the locality is required with like for like species positioned a minimum of 5 m away from the Onshore Cable Route in discussion with the relevant LPA.

6.6. SECTION 5 - FARLINGTON

6.6.1. ARBORICULTURE AND LANDSCAPE

6.6.1.1. Opportunities should be reviewed at detailed design to minimise impacts, where practicable. Final details of route alignment must be agreed under the supervision of the Environmental Clerk of Works.

6.6.1.2. High/medium value features including impacting on trees subject to TPOs should be avoided where practicable, and design and construction should follow BS 5837 as a minimum.

6.6.1.3. Hedgerows, hedgerow trees and ornamental trees lost should be replaced with like for like species subject to agreement with PCC with trees positioned a minimum of 5 m away from the Onshore Cable Route.

6.6.1.4. Where practicable design should avoid positioning cables in conflict with RPA's of existing trees. Where significant incursion is unavoidable, consideration for replanting in the locality is required.

6.6.1.5. In agreement with PCC, in the event that TPO feature H896 (201/1997) requires replacement, other than the poplar (T925), these features will be replaced with like for like species. For T925, alternative species such as beech, sweet chestnut or yew would be considered.

6.7. SECTION 6 – ZETLAND FIELD AND SAINSBURY'S CAR PARK

6.7.1. ARBORICULTURE AND LANDSCAPE

6.7.1.1. High value features should be avoided where practicable, and design and construction must follow BS 5837 as a minimum. Where medium value features are at risk of removal, impacts should be minimised to secure the retention of as many features as practical through detailed design measures considering Onshore Cable Micrositing.

6.7.1.2. Design must avoid positioning cables in conflict with RPA's of existing trees. Where significant incursion is unavoidable, consideration for replanting in the locality is required with like for like species subject to agreement with PCC positioned a minimum of 5 m away from the Onshore Cable Route.

6.8. SECTION 7 – FARLINGTON JUNCTION TO AIRPORT SERVICE ROAD

6.8.1. ARBORICULTURE AND LANDSCAPE

6.8.1.1. Through detailed construction works traffic should avoid impacting on medium value tree groups (S680, G783, G706, G671 and G582) which form strong landscape features, including individual trees within Farlington playing fields, mature avenue trees running to the pavilion, within the car park and around the northern and western edge of the hotel. Trees affected by construction work traffic should be pruned back, monitored and replaced where practicable with like for like species subject to agreement with PCC. Replacement trees should be repositioned at least 5 m away from the Onshore Cable Route.

6.8.1.2. Arboricultural features G663, W885, and W886, serve a limited visual amenity function. Where practicable, design should avoid positioning cables in conflict with RPAs of existing trees. Where significant incursion is unavoidable, trees must be replaced with like to like species subject to agreement with PCC and positioned at least 5 m away from the Onshore Cable Route. It is assumed a similar tree mix would be planted on either side of the access road into Kendalls Wharf and Andrew Simpson Watersports Centre allowing for easements associated with the Onshore Cable Route.

6.8.1.3. For south of Eastern Road on Portsea Island, alternate routes down the eastern side of Baffins Milton Rovers Football Ground (Kendall Stadium), would avoid impacting on medium value arboricultural resources (G695, G711 and T70), which are also an important landscape feature in terms of contributing to visual amenity and screening, and provide an opportunity to traverse this portion of the route between RPAs of lower quality arboricultural resource.

6.8.1.4. Considered design is needed within this section to avoid impacts to large groups of roadside trees, while balancing impacts on traffic congestion, for example, where cables may be positioned within the carriageway.

6.8.1.5. Design of works to cross Langstone Harbour would need additional arboricultural input to mitigate any impacts.

6.9. SECTION 8 – EASTERN ROAD (ADJACENT TO GREAT SALTERNS GOLF COURSE) TO MOORINGS WAY

6.9.1. ARBORICULTURE AND LANDSCAPE

6.9.1.1. Impacts to Milton Locks Conservation Area should be avoided.

6.9.1.2. Medium value features should be avoided, and design and construction must follow BS 5837 as a minimum.

6.9.1.3. Where practicable, design should avoid positioning cables in conflict with RPA's of existing trees including across Milton Common and the eastern edge of Portsmouth College/Eastern Road. Where significant incursion is unavoidable consideration for replanting in the locality is required with like for like species subject to agreement with PCC, and trees planted 5 m beyond the Onshore Cable Route.

6.9.2. GROUND CONDITIONS

6.9.2.1. Mitigation measures required specifically where the route traverses Milton Common include:

- The works will be carefully and sensitively managed and executed to minimise impact on the local environment through the use of appropriate mitigation measures outlined below.
- There is a potential for noise, dust and odour impacts in the immediate vicinity of the proposed excavations within Milton Common. The appointed contractor will prepare a detailed specification of the proposed excavation and installation methodology in this location outlining the measures to be put in place to monitor and mitigate such impacts.
- the introduction of an exclusion zone in the immediate area of the excavation to keep members of the public at distance.
- excavation of the trench in short lengths to minimise odour and dust impacts.
- a programme of noise, dust and odour monitoring with agreed red/amber/green alerts and associated actions to reduce impacts.
- odour control such as the installation of a perimeter fog and misting system.
- agreed limits on hours of working.

- A programme of community engagement will be carried out before and during the works to inform the local community of the nature of the works and to provide comfort and reassurance that the works will be carried out in a way that minimises impacts as far as is reasonably practicable. This may include local notices, mail drops, liaison with the LPA.
- The excavated waste will be carefully segregated and handled so as not to contaminate areas away from the works themselves. Excavated materials will be removed from site and disposed of or treated for reuse at a suitably licensed waste receiving facility. Full details and records of the movement of excavated soils will be presented in a Verification Report upon completion of the works.
- Reinstatement of an engineered landfill cap to its existing condition or better.
- Clay stanks (or similar) will be installed at regular intervals along the trench to prevent migration of landfill gas along the route and beyond the existing gas vent trench around Milton Common.
- Appropriate gas protection measures will be applied to access chambers or jointing pits to prevent ingress of landfill gas.
- Should significant unexpected contamination be encountered this will be managed appropriately and reported to the EA. If required, the contamination risk assessment and remediation strategy will be updated.

6.10. SECTION 9 – MOORINGS WAY TO BRANSBURY ROAD

6.10.1. ARBORICULTURE AND LANDSCAPE

6.10.1.1. Significant constraints on tree group G900 within Milton Lock Nature Reserve must be minimised, trees are of medium value and serve an important screening function. Tree group G697 within Bransbury Park should also be avoided, trees are of medium value and important in terms of visual amenity.

6.10.1.2. In general, high and medium value features should be avoided. Where practicable, design should avoid positioning cables in conflict with RPAs of existing trees. Where significant incursion is unavoidable, trees should be replaced with like for like species subject to agreement with PCC and planted 5 m beyond the Onshore Cable Route. Opportunities should also be explored to remove trees in poor condition and, where appropriate, replace with other ornamental species in agreement with PCC.

6.10.1.3. In terms of Furze Lane, an alternative route from an arboricultural and landscape perspective would be to use the sports fields located within the Order Limits and to the east of the university building. For landscape the TPO'd trees along Furze Lane form an important visual screen, amenity and legibility function.

6.10.1.4. Through initial discussions with PCC, should the Proposed Development result in the loss of trees subject to TPOs along Furze Lane, these features would be replaced with evenly spaced planting with a fastigiate tree species in agreement with PCC. Opportunities would also be explored to remove trees in poor condition and, where appropriate, replace with other species in agreement with PCC.

6.10.1.5. It would be possible to minimise the long-term impact on retained trees within Bransbury Park through Onshore Cable Micrositing within the Onshore Cable Corridor, under the supervision of the Environmental Clerk of Works.

6.11. SECTION 10 – EASTNEY (LANDFALL)

6.11.1. ARBORICULTURE AND LANDSCAPE

6.11.1.1. In general, medium value features including TPO'd trees should be avoided, where practicable. Design and construction should follow BS 5837 as a minimum.

6.11.1.2. Design must avoid positioning cables in conflict with RPA's of existing trees. Where significant incursion is unavoidable, trees should be replaced with like for like species subject to agreement with PCC and planted 5 m beyond the Onshore Cable Route. The northern (east bound) side of Henderson Road and Fort Cumberland Road would be a preferred choice to avoid impact on existing street trees in this section.

7. MONITORING

7.1. MONITORING AND REVIEW

7.1.1.1. The Environment Manager will hold the responsibility for maintaining a register of all environmental monitoring, which will be made available for auditing and inspection.

7.1.1.2. Reporting procedures will be defined by the Environment Manager who will hold overall responsibility for providing feedback to the appointed contractor on the environmental performance of the construction works.

7.1.1.3. A Framework for environmental monitoring on site is set out in Table 7.1. Records of environmental inspections and audits will be kept and appended to the CEMP.

Table 7.1 - AQUIND Onshore Monitoring Plan

Receptor	Description of Impact	Description of Monitoring	Frequency and timing	Responsibility
Landscape and Visual Amenity				
Management of vegetation	Management of vegetation through a long-term Outline Landscape and Biodiversity Strategy which would form part of the draft DCO's requirements and implemented prior to detailed design is approved by the host authority in the form of an Outline Landscape and Biodiversity Strategy.	Environmental Clerk of Works and toolbox talks based on relevant environmental commitments to oversee maintenance, monitoring and management works and monitor success of mitigation measures.	Construction/Operation	appointed contractor to appoint Specialist Contractor
Arboriculture				
Protection of trees	To reduce the potentially effects	Detailed analysis of impacts on trees as the cable route alignment is	Construction	Environmental Clerk of Works

	relating to tree RPAs.	finalised must be carried out under supervision. This must be by a suitably qualified clerk of works to oversee construction works within RPA of retained arboricultural features.		
Onshore Ecology				
Seed harvesting and reseeding at Denmead Meadows, Kings Pond Meadow SINC and Unimproved Neutral Grassland	Re-seeding will take place using collected seed in spring following the completion of construction works.	Subject to landowner permissions, monitoring will be undertaken to inform potential management interventions at the site. The monitoring will comprise botanical survey of the reseeded areas, and will allow interventions that may be necessary to maintain HPI-quality grassland remains in the long-term.	Operational Stage, years 1, 3 and 5 post development	Appointed contractor to appoint Specialist Contractor

Construction impacts to the environment	Impacts to the environment during the Construction Stage	Implementation of the measures identified will be monitored by an Ecological Clerk of Works with the power to stop work and change site practices as required.	Construction	Ecological Clerk of Works
Soils and Agricultural Land Use and Waste and Material Resources				
Construction impacts to soil, waste and material resources	To reduce the potentially significant effects relating to the loss and degradation of the soil resources and disposal methods	Monitoring measures to be adopted across the Proposed Development would include, as a minimum, the implementation of a CEMP, incorporating a MMP and SWMP by the contractor, once appointed.	Construction	Appointed contractor and Environmental Advisor/Manager
Ground Conditions				
Contaminated land at Milton Common	Disturbance of contaminated land	A detailed management plan for future maintenance and entry to below ground access chambers will be required (e.g., personal gas alarms,	Construction and Operation	Appointed contractor to appoint Specialist Contractor

		emergency recovery hoists, etc.). The detailed management plan will be prepared during the detailed design stage and will form part of the Health and Safety File for the Proposed Development.		
Heritage and Archaeology				
Archaeological remains	Disturbance of Archaeological remains	Depending on the results of the Trial Trench evaluation, mitigation could take the form of targeted archaeological excavation (preservation by record) in advance of construction and/or an archaeological watching brief. Archaeological watching brief (a programme of 'strip, map and sample) carried out alongside the preliminary topsoil removal.	Construction Stage	Any archaeological work would need to be undertaken in consultation with the local authority's archaeological advisor in accordance with an approved archaeological WSI.

Air Quality				
Human and Ecological receptors	Risk of fugitive emissions of dust and air emissions on human health and ecology at the ten Onshore Cable Corridor Sections	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of Construction site boundary, with cleaning to be provided if necessary.	Construction Stage	Appointed contractor to appoint Specialist Contractor
		Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked		

		Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.		
		Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where practicable, commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.		

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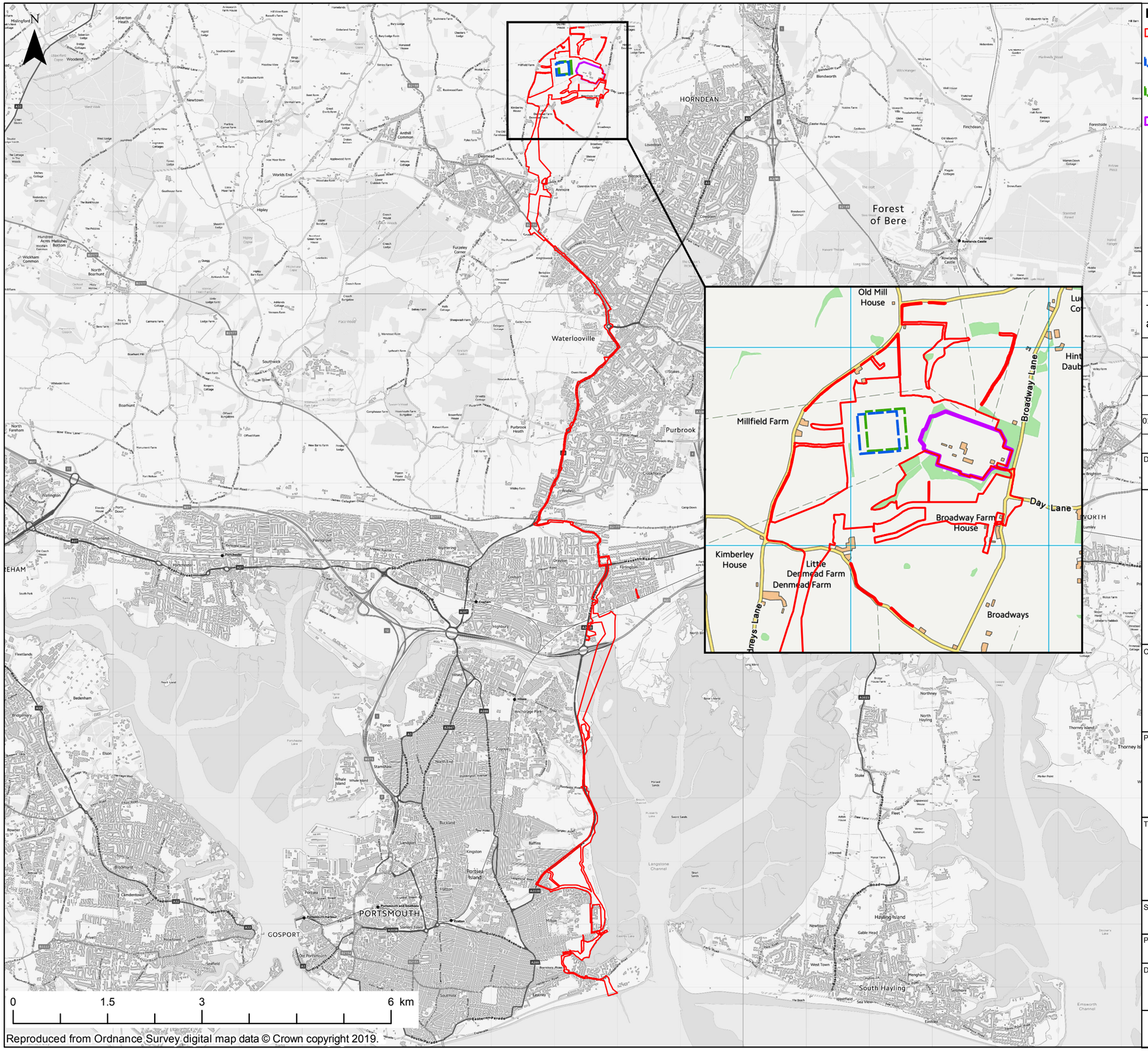
Appendix 1 – Site Drawings and Environmental Constraints



The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2017 – Regulation 5(2)(a)

REV	DATE	BY	DESCRIPTION	CHK	APP
01	29/10/2019	JT	First Issue	GI	MMcG

DRAWING STATUS: Final

WSP House, 70 Chancery Lane, London, WC2A 1AF, UK,
T+ 44 (0) 020 7314 5000
wsp.com

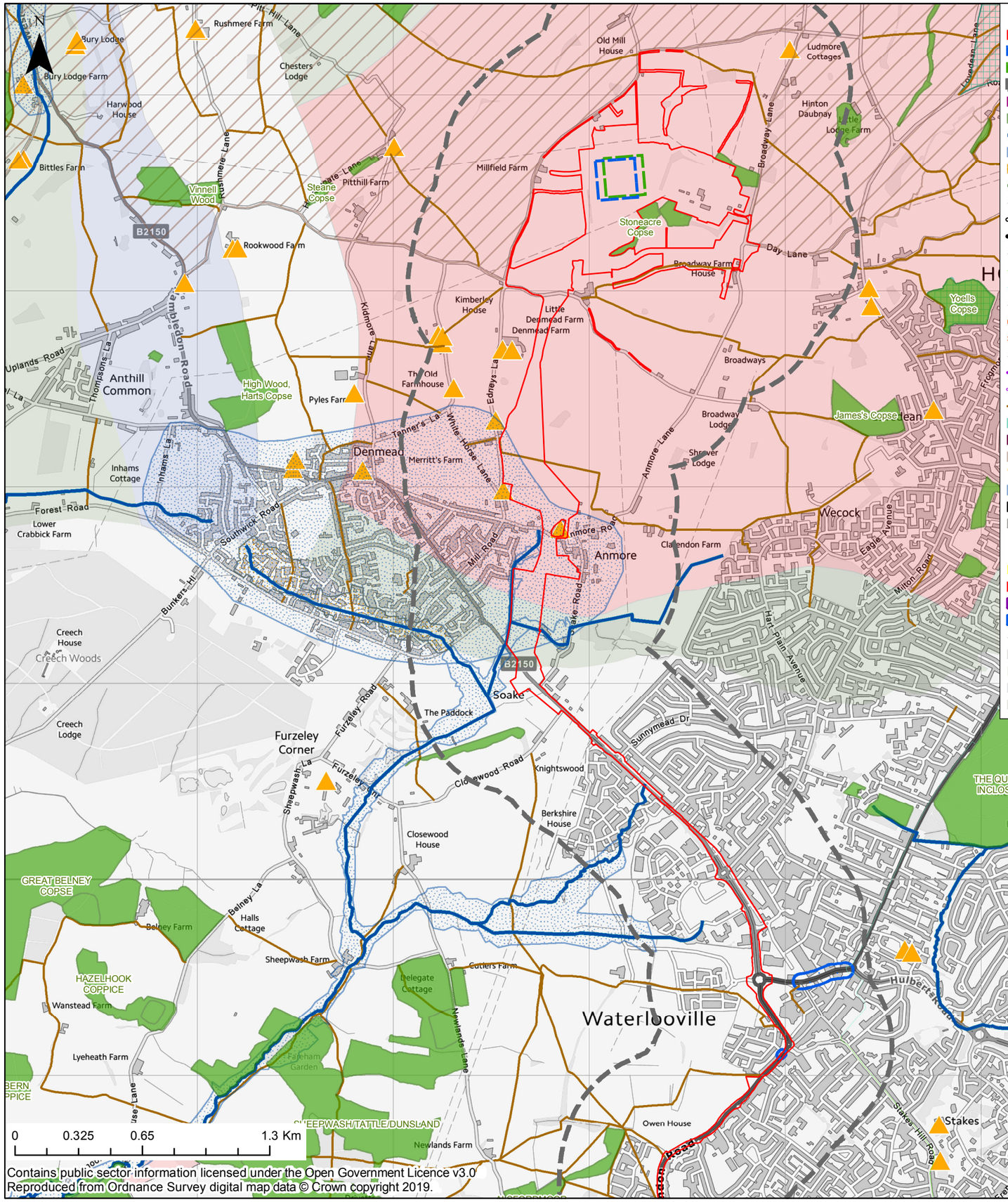
CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 1
Order Limits (Onshore)

SCALE AT A3	CHECKED:		APPROVED:
1:59,806	GI		MMcG
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	JT	JT	29/10/2019

DRAWING NO: EN020022-ES-3.2 REV.NO. 01



Key

- Order Limits
- Converter Station Perimeter Option B (i)
- Converter Station Perimeter Option B (ii)
- Order Limts 500m Buffer
- Common Land
- Ancient Woodland Inventory
- Statutory Main Rivers
- Flood Alert Areas
- Flood Warning Areas
- National Trail

Sustrans Local Route

- Off Road
- On Road

Sustrans National Route

- National Route (on road)
- National Route (off road)

Sustrans National Cycle Network Link

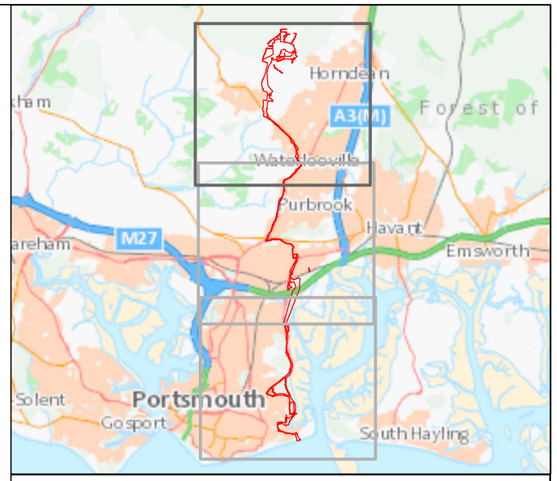
- NCN Link (on road)
- NCN Link (off road)

Sustrans Regional Route

- Regional Route (on road)
- Regional Route (off road)
- Public Rights of Way
- Local Nature Reserve
- National Nature Reserve
- National Park
- Special Protection Area
- Special Area of Conservation
- Ramsar Site - Wetland of International Importance
- Site of Special Scientific Interest
- Listed Building
- Historic Parks and Gardens
- Scheduled Monument
- Air Quality Management Area (2017)
- Noise Action Planning Important Areas (NIA)

Source Protection Zones

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment
- Zone of Special Interest



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 5(2)(I)

REV	DATE	BY	DESCRIPTION	CHK	APP
01	23/10/2019	JT	Final	GI	US

DRAWING STATUS: FINAL

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PROJECT: AQUIND Interconnector

TITLE: Figure 2
Environmental Constraints Map
Sheet 1 of 3

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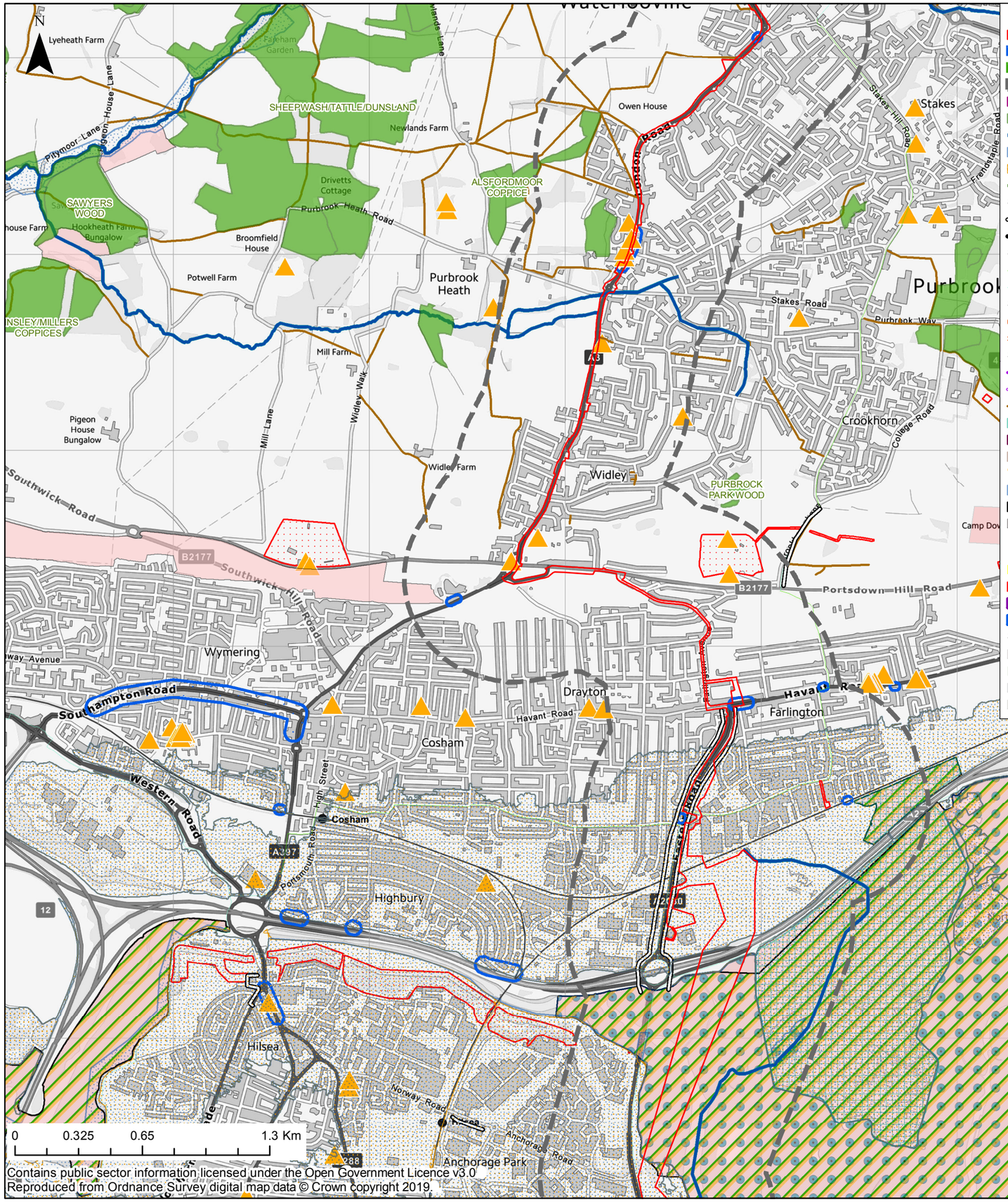
DRAWING NO: EN020022-ES-3.13-Sheet1 | REV.NO. 01



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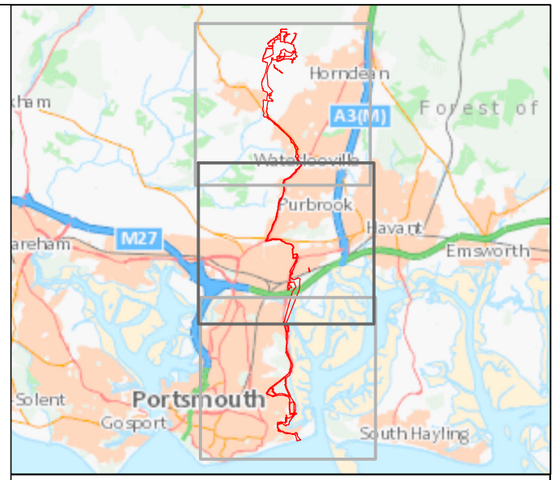

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REV	DATE	BY	DESCRIPTION	CHK	APP
01	23/10/2019	JT	Final	GI	US

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PROJECT: AQUIND Interconnector

TITLE:
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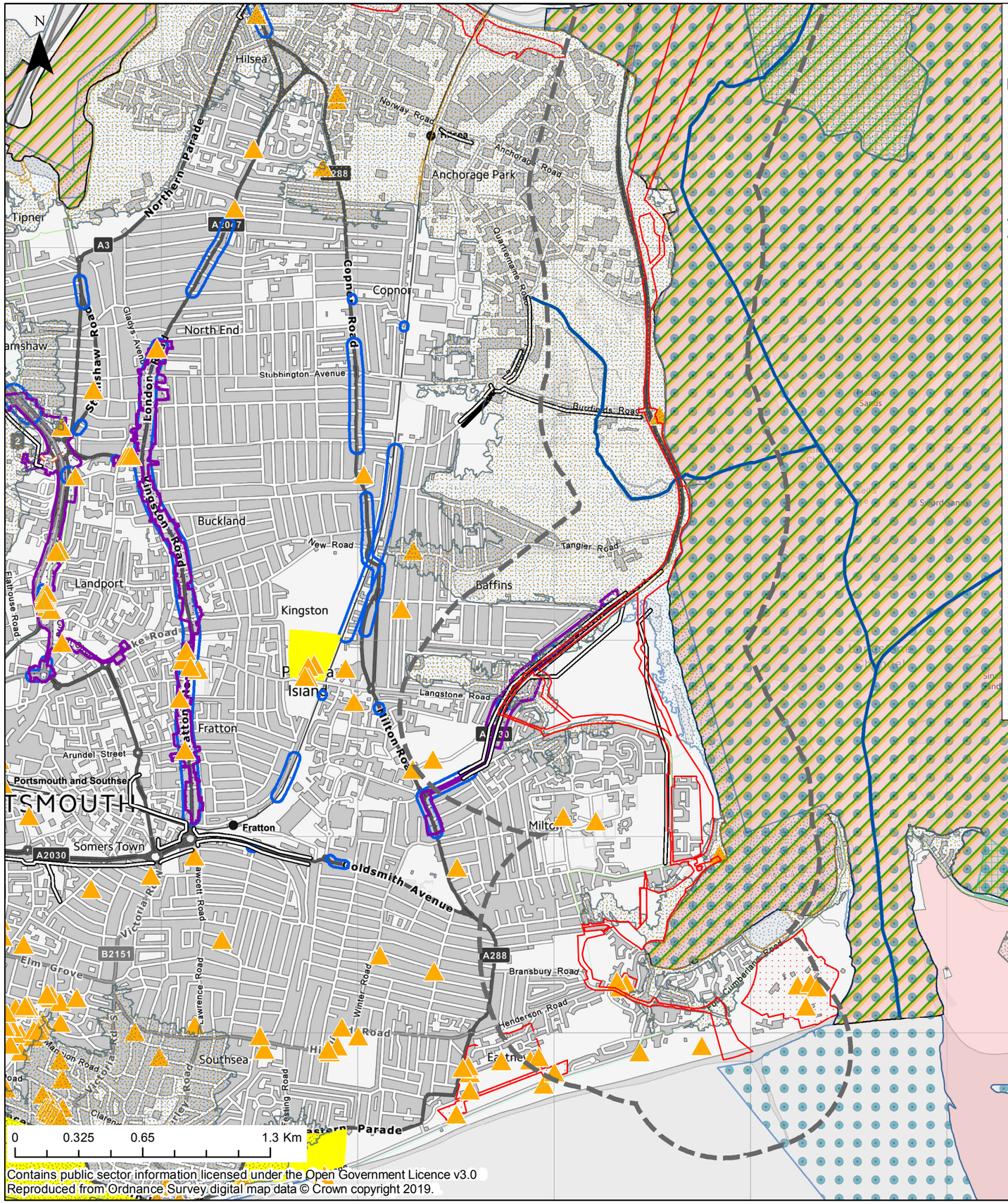
DRAWING NO: EN020022-ES-3.13-Sheet2

REV.NO. 01



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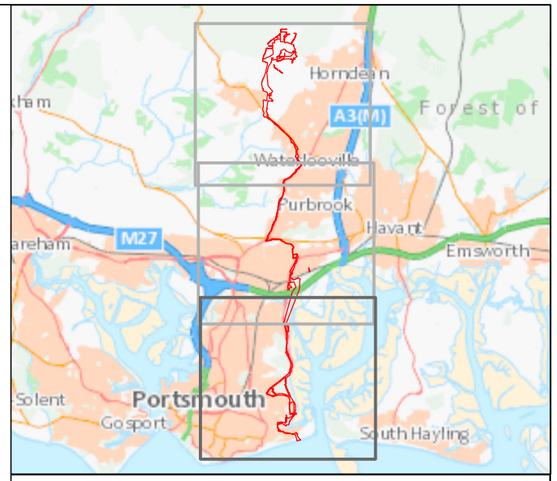

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TITLE:
Figure 2
Environmental Constraints Map
Sheet 3 of 3

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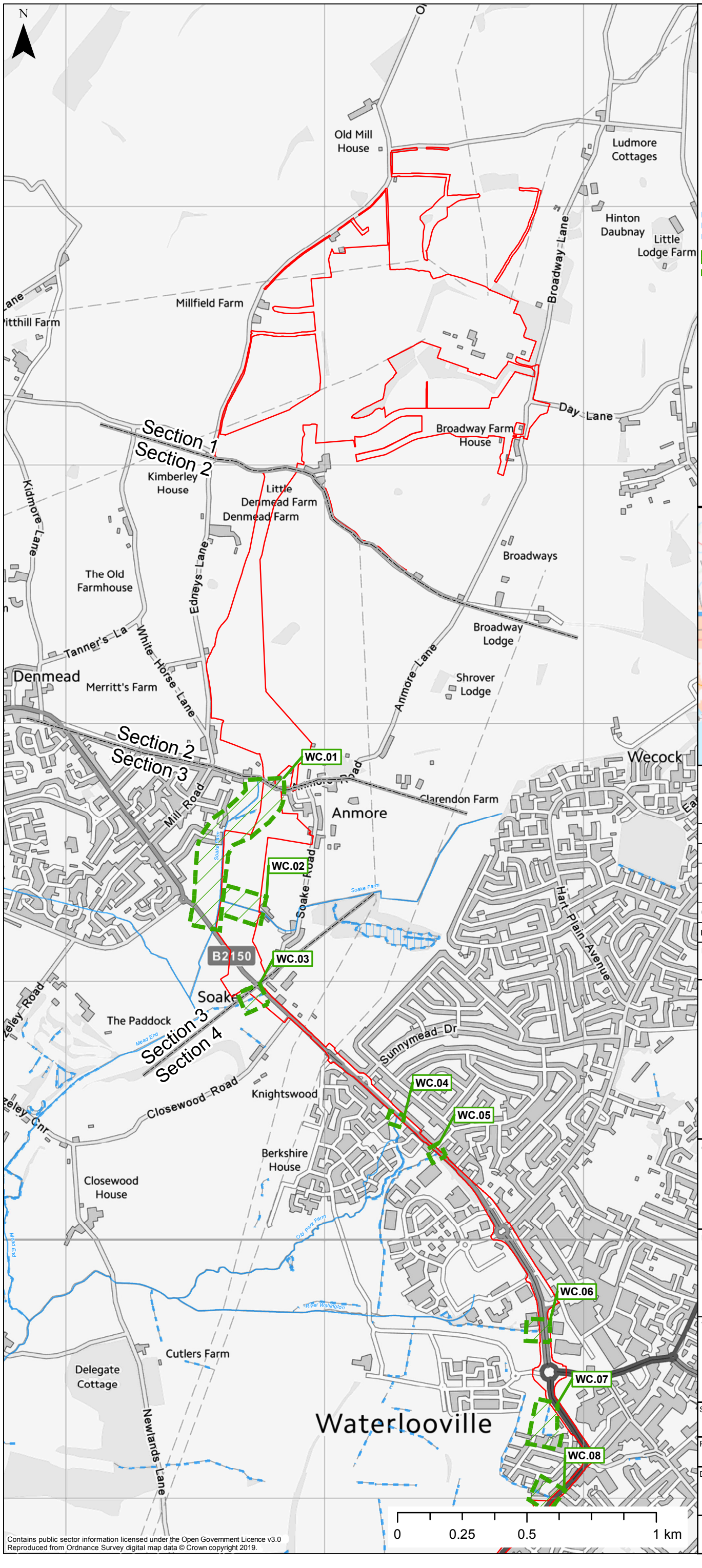
DRAWING NO: EN020022-ES-3.13-Sheet3 | REV.NO. 01

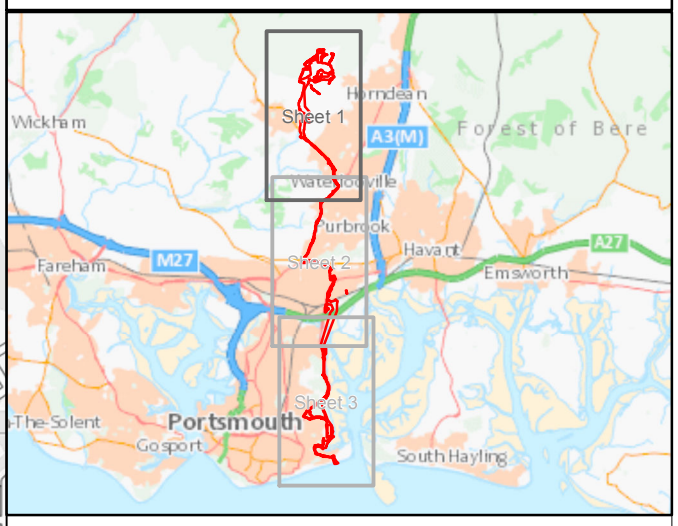


Key

- Order Limits
- Order Limits Section Breaks

STATUS

- Main River
- Ordinary Watercourse
- Water Body
- Watercourses within or directly adjacent to Onshore Order Limits



The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2017 – Regulation 5(2)(l)(iii)

REV	DATE	BY	DESCRIPTION	CHK	APP
01	29/10/2019	JT	Final	JW	EI

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TITLE: Figure 3
Watercourses
Sheet 1 of 3

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EN020022	JT	JT	29/10/2019

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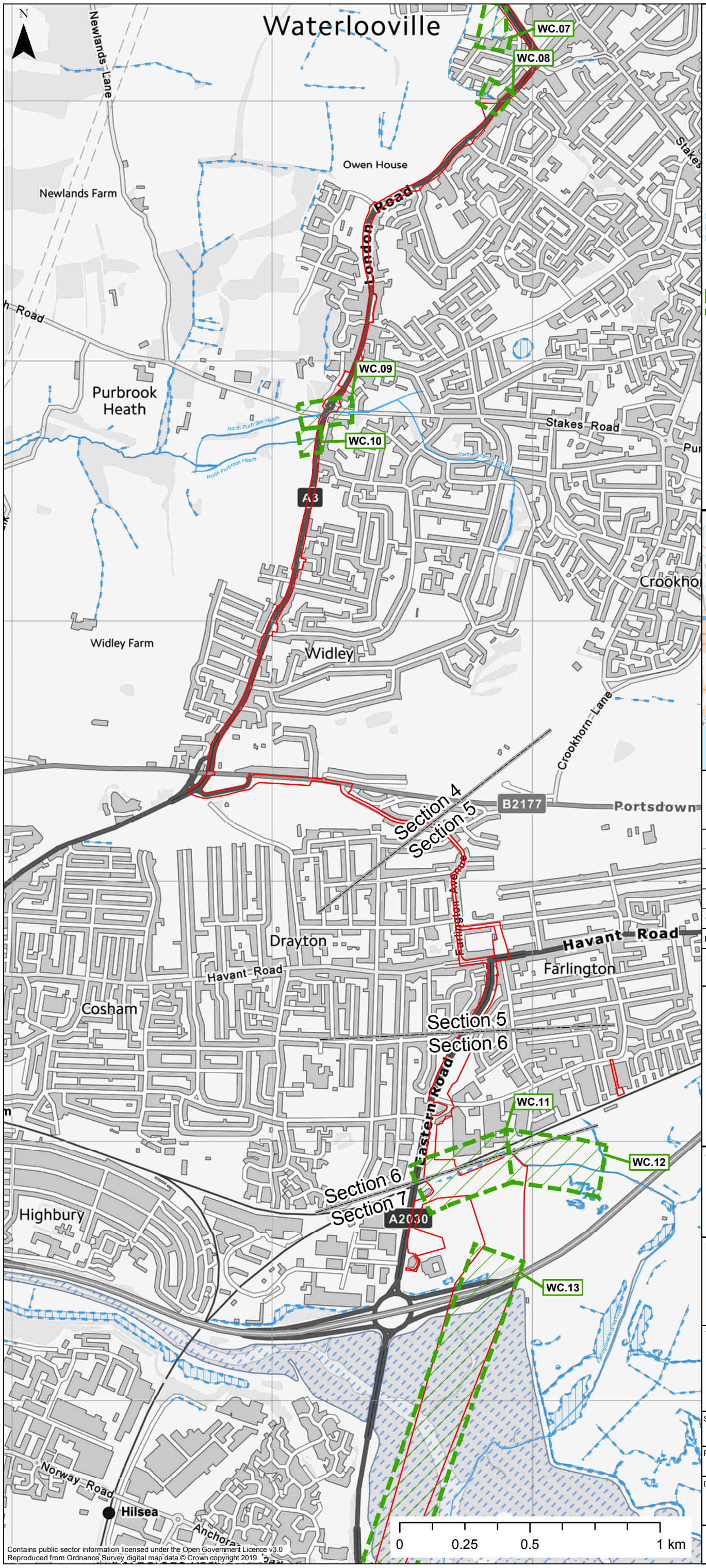

Key

- Order Limits
- Order Limits Section Breaks

STATUS

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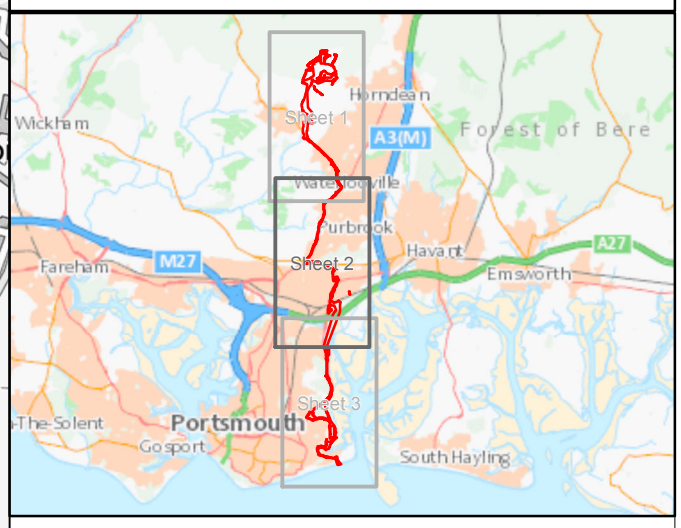
- Watercourses within or directly adjacent to Onshore Order Limits



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01	29/10/2019	JT	Final	JW	EI

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Watercourses
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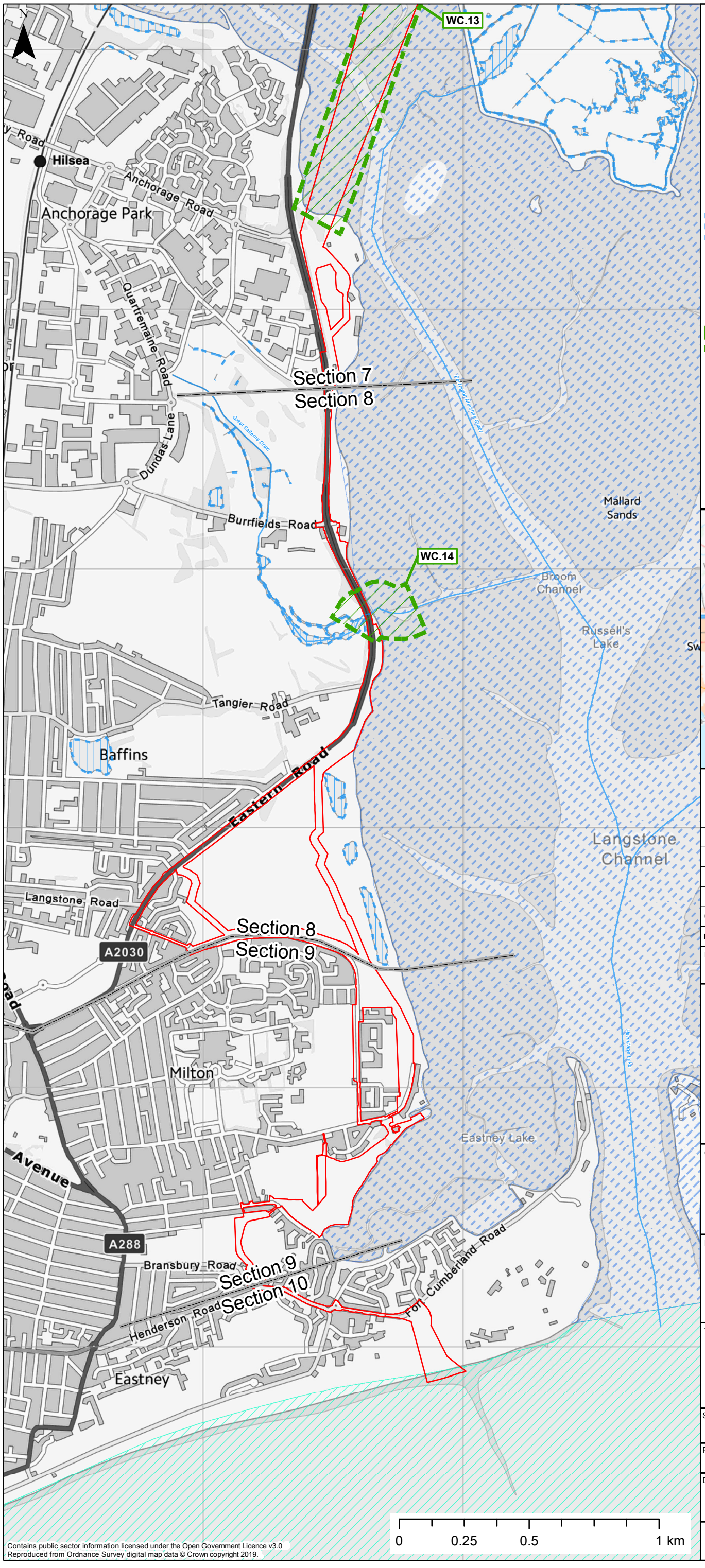

Key

- Order Limits
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STATUS

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- Solent
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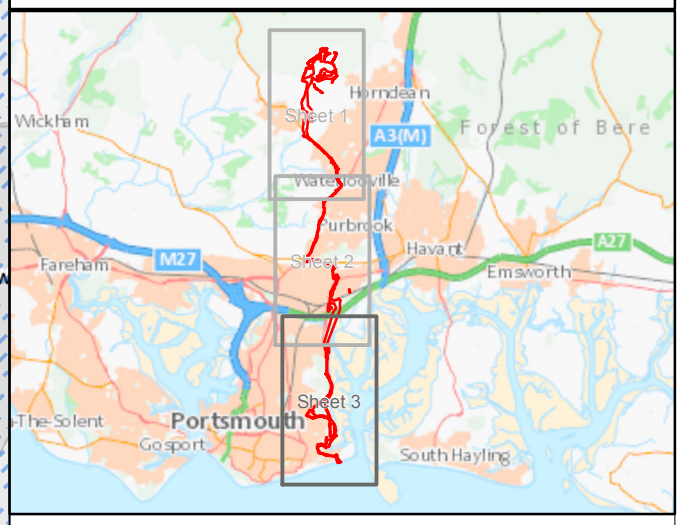

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REV	DATE	BY	DESCRIPTION	CHK	APP
01	29/10/2019	JT	Final	JW	EI

DRAWING STATUS: FINAL

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TITLE: Figure 3
Watercourses
Sheet 3 of 3

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PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	JT	JT	29/10/2019

DRAWING NO: EN020022-ES-20.3-Sheet3

REV.NO. 01

Appendix 2 – Relevant Legislation

Environmental Legislation	Summary of Relevance to the Site
Hazardous substances	
Control of Substances Hazardous to Health (COSHH) Regulations 2002 (and amended 2003, 2004)	The COSHH regulations provide a legal framework for controlling people's exposure to all 'very toxic, toxic, harmful, corrosive or irritant' substances and apply to all places of work. There are various requirements including an assessment of the risk to the health of employees arising from their work and what precautions are needed, introduction of appropriate measures to prevent or control the risk (ensuring that measures of control do not increase the overall risk to health and safety), use of control measures and maintenance of equipment.
Waste	
Control of Waste (Dealing with Seized Property) (England and Wales) Regulations Statutory Instrument ('SI') 2015/426	This legislation provides powers to control fly-tipping and prevents the unlicensed transport of waste materials. All carriers of controlled waste including the producers of building and demolition waste are required to be registered with the EA. Controlled waste is defined as household, industrial, radioactive or commercial waste other than agricultural, mineral/ quarrying or explosive wastes. This registration must be renewed every 3 years.
The Environmental Permitting (England and Wales) Regulations 2010 (amended 2011, 2012, 2013, 2014, 2015 and 2016)	The Regulations consolidate the Pollution Prevention and Control and waste Management Licencing regulations to provide a more streamlined approach to environmental regulations, by allowing for a number of different activities to be regulated under one permit by the EA.
Hazardous Waste (England and Wales) Regulations 2005 (amended 2009)	The Regulations ensure the sound management, storage and safe disposal of hazardous wastes, to prevent environmental pollution and harm to human health. 'Hazardous' waste applies to wastes which contain any substance which: is listed a hazardous waste in the List of Waste Regulations 2005 (see below);

	is exceptionally classified as hazardous by the Secretary of State or any of the National Executives; or is declared hazardous by virtue of any regulations under section 62 of the Environmental Protection Act (EPA) 1990. All hazardous waste movements require pre-notification to the EA prior to any hazardous waste being produced (where possible). Producers are required to know and document the quantity, nature, origin and final destination of the Hazardous Waste and to certify that the waste carrier is registered under the Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991. Copies of the completed consignment notes must be retained for at least 3 years by all those in the waste chain.
Hazardous Waste (England and Wales) Regulations 2005 and Hazardous Waste (Miscellaneous Amendments) Regulations SI 2015/1360	These regulations relate to environmental permitting, landfill allowances, hazardous and non-hazardous waste. The definitions of Waste Framework Directive and the WEEE Directive have been updated within amended legislation to refer to the current legislation; Directives 2008/98/EC and 2012/19/EU.
Environmental Protection (Duty of Care) Regulations 1991 (as amended, SI 1991/2839)	A legal duty of care is imposed on anyone – from producers, to carriers and disposers of waste, to ensure that: Waste is not illegally disposed of or dealt with without a licence or in breach of a licence or in any way that causes pollution or harm; Waste is transferred only to an 'authorised person', i.e. a local authority, registered carrier or a licensed disposer; and When waste is transferred, it is accompanied by a full written description which forms part of a waste transfer note (or consignment note for hazardous wastes). All persons subject to duty of care are required to ensure that neither they nor any other person commit an offence under the Regulations.
Environmental Protection Act (EPA) 1990: Part 2 –	This Act builds on the system put in place by the Control of Pollution Act with stricter licensing controls and other provisions aimed at ensuring waste handling, disposal

Waste on Land (amended 2010 and 2019)	and recovery operations do not harm the environment. It reorganised Local Authority responsibilities for waste management, introduced a duty of care for producers and handlers of waste and described the offences of unauthorised storage, treatment and disposal of waste.
Environmental Protection Act (EPA) 1990: Part 2a (as amended)	The section of the EPA created by the Environment Act 1995 setting out the legislative framework for identifying and dealing with contaminated land.
Environment Act 1995 (as amended)	Inserted Part '2a' to the EPA 1990 giving powers and responsibilities to Local Authorities regarding contaminated land.
Discharge to Water / Land	
Anti-Pollution Works Regulations 1999 SI 1999 / 1006	Aimed at ensuring that site owners pay for the prevention and remediation of pollution arising from their activities. Notices can be served by the EA directing a site owner to carry out anti-pollution works where any poisonous, noxious or polluting matter is likely to enter, or to be, or to have been present in any controlled waters.
Water Industry Act 1999	The Act prohibits certain discharges to sewers including: Any matter likely to injure the sewer or interfere with the free flow of its contents or to affect the treatment, disposal of its contents; Liquid waste or steam at a temperature higher than 110ºF or any other chemical waste which is dangerous, a nuisance or prejudicial to health; Any petroleum spirit; and Calcium carbide. Trade effluents may be discharged into public sewers only with the consent, or by agreement with, the sewerage undertaker (i.e. local water company). The consent may stipulate conditions relating to: Nature or composition of the effluent; Maximum daily volume allowed; Maximum daily rate of flow; and Sewer into which the effluent is discharged.

Water Resources Act 1991 (amended 2009)	The Act requires water abstractions to be licensed and certain discharges into controlled waters to be subject to EA consent. It is an offence under the Act 'to cause or knowingly permit': Poisonous, noxious or polluting matter, or any solid waste matter, to enter controlled waters Matter, other than trade or sewage effluent, to be discharged from a sewer in contravention of a relevant prohibition; Trade or sewage effluent to be discharged into controlled waters or through a pipe into the sea (beyond the controlled waters) Unauthorised work in a water protection zone; Trade or sewage effluent to be discharged onto land or into a lake or pond in contravention of a relevant prohibition or; Any matter to enter inland waters so as to cause or aggravate pollution by impeding flow. Pollution from individual discharges into water is controlled by a system of discharge consents which set legal limits on the type, concentration and total volume of discharge which can be released. If a pollution incident occurs, a description of the nature and extent of harm must be produced.
Water Act 2003 and 2014	The Water Act replaces parts of the Water Resources Act 1991 and will be fully implemented by 2012. The Water Act introduces a new abstraction licence system which reduces the number of licences and encourages the development of Catchment Abstraction Management Strategies (CAMS).
Groundwater (England and Wales) Regulations 2009	The Regulations transpose the requirements of the Groundwater Directive into UK legislation. The Regulations aim to prevent and limit the pollution of groundwater by certain listed substances or groups of substances. The listed substances are the same as those in the Groundwater Directive. The Regulations aim to prevent entry of List I substances into groundwater and prevent groundwater pollution by List II substances.

	The direct or indirect discharge of List I or II substances must be subject to prior investigation and authorisation. The Regulations also allow notices to be served to control activities which might lead to an indirect discharge of List I substances or groundwater pollution by an indirect discharge of substances in List II.
Control of Pollution (Oil Storage) (England) Regulations 2001	These Regulations require a person having custody or control of oil to carry out certain works and to take certain precautions and other steps for preventing pollution of any waters which are controlled waters for the purposes of Part III of the Water Resources Act 1991. The Regulations impose general requirements in relation to the storage of oil and the types of container used. Where the EA considers that there is a significant risk of pollution of controlled waters from the oil in question it has the power to serve a notice on the person having custody or control to minimise the risk.
Contaminated Land (England) Regulations 2000 (as amended 2006 and 2012)	Local Authorities have a duty to inspect land, to identify contamination and to decide whether any such land should be designated a 'special site'. Public registers of contaminated land and special sites are kept by the local authority and the EA. Following designation of land as contaminated or a special site, the enforcing authority can serve a remediation notice on the appropriate person(s) specifying what needs to be done and the period within which remedial work should be completed. The appropriate person will be the person(s) who caused or permitted the contamination of the land. If this person cannot be identified, then responsibility falls to the current occupier or owner of the land.
Building Regulations 2010 SI 2010 / 2214	The Regulations impose requirements upon people carrying out certain building operations, including new buildings, building extensions and a material change of use of land or a building. Building work must comply with schedule 1 of the Regulations which include minimum standards for various aspects including site preparation, toxic substances, drainage etc.
Emissions to Air / Noise	

Control of Pollution Act (COPA) 1974 (Sections 60, 61) (amended 1989)	Section 60 of COPA gives powers to the Local Authority to control noise and vibration from construction sites. The basis of the COPA legislation is that Best Practical Means should be used to control noise and vibration pollution. Control is by service of an abatement notice (under S60) on the person responsible for the noise requiring specific controls to minimise noise and vibration. The notice may specify types of plant and machinery, hours of work, boundary noise levels, etc. Section 61 provides for the Contractor to apply to the Local Authority for consent before works commence. This protects the contractor from action by the local authority under S60, but not from individual residents' complaints.
Clean Air Act 1993	The Act prohibits, subject to certain conditions, the emission of dark and black smoke from chimneys serving boilers and other industrial plant. Limits also apply to dust, grit, sulphur and car fume emissions. All new furnaces shall be so far as practicable, smokeless. The Local Authority is empowered to undertake an examination of a plant likely to be causing air pollution, taking into account the possible relevance of statutory exemptions.
Noise and Statutory Nuisance Act 1993	This Act amends the Environmental Protection Act (EPA) 1990 to make noise emitted from vehicles, machinery or equipment in the street a statutory nuisance. It gives the Local Authority powers to serve an abatement notice on the person responsible.
Noise Act 1996	Introduces a new procedure for Local Authorities to seize noisy equipment, in relation to statutory nuisance offences under the EPA 1990.
Control of Noise at Work Regulations 2005	Requires that all employers must conduct an assessment of the exposure and therefore of the risk of their employees to noise where they have reason to believe that any of the specified action levels for various noise exposures is or could be exceeded.
Construction Plant and Equipment (Harmonisation of Noise Emission	Provides for examination and certification of construction plant that comply with noise emission standards. The Regulations require that plant is certified by approved bodies. Various types of plant

Standards) Regulations 1985 (as amended 1995)	manufactured after the dates of the regulations are to meet noise emission standards and are certified as such.
Environmental Protection Act (EPA) 1990: Part 3 – Statutory Nuisance (section 80)	When a complaint of statutory nuisance is made to the Local Authority by a person living in its area, the Authority has to take steps to investigate the nuisance. Statutory nuisances include any premises maintained in such a state to be prejudicial to health or a nuisance; any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance. Noise emitted from premises so as to be prejudicial to health or a nuisance.
Vehicles	
Road Vehicles (Construction and Use) Regulations 1986 (as amended 2015)	It is an offence to use a vehicle if it is emitting 'smoke, visible vapour, grit, sparks, cinders or oily substances' in such a way as is likely to cause 'damage to any property or injury to any person'. It is an offence to use a vehicle in such a way as to cause excessive noise.
Road Traffic (Vehicle Emissions) (Fixed Penalty) Regulations 1997 (as amended 2002 and 2003)	These Regulations give powers to Local Authorities to enforce vehicle emission standards at the roadside as part of the implementation of the national air quality strategy. Under the Regulations, Local Authorities may issue fixed penalty notices to users of vehicles that do not comply with emissions standards set in the Road Vehicles (Construction and Use) Regulations 1986 as amended. Appropriately trained Local Authority officers can test emissions from vehicles with the help of a uniformed police officer to stop the vehicle. The Local Authority officer may also issue a fixed penalty notice to drivers who leave their engines running unnecessarily.

Appendix 3 – Outline Site Waste Management Plan

OUTLINE SITE WASTE MANAGEMENT PLAN

INTRODUCTION

1.1.1.1. This Outline Site Waste Management Plan ('SWMP') defines the procedure by which waste will be managed during the lifetime of the Proposed Development, with all relevant information relating to waste going off site via an authorise waste contractor.

1.1.1.2. The Site Waste Management Regulations (2008) were repealed in December 2013 and therefore no legal obligation to provide a SWMP is required. However, these regulations are now commonly used as best practice guidance and provide a useful tool for helping demonstrate the management of waste on a project and to inform the technical assessments at the time of the planning application and in anticipation of the likely planning conditions. The 15 steps of the SWMP are outlined in Section 1.2 and have been written in conjunction with the following documentation:

- Outline Construction Environmental Management Plan ('CEMP');
- Site Waste Management Regulations 2008 (Repealed December 2013*);
- Waste & Resources Action Programme ('WRAP') Construction guidance (www.wrap.org.uk/construction);
- Waste Hierarchy;
- The Waste Regulations 2011;
- The European Waste Catalogue ('EWC'); and
- Other relevant legislation.

1.1.1.3. The aim of this Outline SWMP is to:

- Identify the volume of waste streams likely to be produced during the works to establish the potential for reuse and recycling;
- Identify possible options for waste to be 'designed out';
- Identify opportunities for waste minimisation and management;
- Identify the most significant opportunities to increase re-use and recycling rates;
- Identify suitable waste management contractors and record appropriate licences, permits, waste transfer notes and hazardous waste consignment notes;

- Consider appropriate site practices such as how materials will be segregated and the measures that will be used for raising awareness among site operative for waste reduction, reuse and recycling; and
- Set out the method for measuring and auditing Construction and Excavation waste to enable more effective waste management through the setting of performance targets for segregation, recycling and monitoring sub-contractors.

1.1.1.4. This Outline SWMP shall be developed into a full SWMP once the Appointed Contractor has been appointed. It is the Appointed Contractor's responsibility to produce the full SWMP and develop the required information in the steps outlined below.

1.1.1.5. This Outline SWMP will evolve during the project as and when information becomes available, and as a result of periodic reviews to ensure continual improvement, compliance and the best cost-effective solutions are in place.

1.1.1.6. The key benefits of having a SWMP for the Client and Appointed Contractor(s) include:

- Providing a structured and forward-thinking approach to waste management and sustainability onsite;
- Collate all Duty of Care information, waste data etc. from the whole supply chain;
- Identifying savings through improved design, resource efficiency, ordering, material storage and handling to eliminate waste at source;
- Assisting with compliance of internal Environment Management Systems ('EMS'), objectives and targets, and associated Key Performance Indicators ('KPIs');
- Greater control of regulatory risks relating to virgin materials, waste storage, handling and disposal at site level;
- Saves environmental resources and money;
- Greater transparency with interested parties including BREEAM, Local Planning Authorities ('LPAs'); Portsmouth City Council ('PCC'), Havant Borough Council ('HBC'), Winchester City Council ('WCC'), East Hampshire District Council ('EHDC') and Hampshire County Council ('HCC'), and the Environment Agency ('EA'); and
- Enhance waste storage and segregation practices to facilitate higher recycling and recovery onsite.

1.1.1.7. All waste will be managed by the Appointed Contractor in accordance with the Waste Hierarchy (see Plate 1 below) (European Parliamentary Research Service Blog, 2016). This principle shall be incorporated by the Appointed Contractor whenever practical, into all stages of work during the course of this project.

1.1.1.8. The hierarchy gives top priority to preventing waste in the first instance, but where waste is created, it gives priority to preparing it for re-use, then recycling, then recovery, and last of all disposal (e.g. landfill).

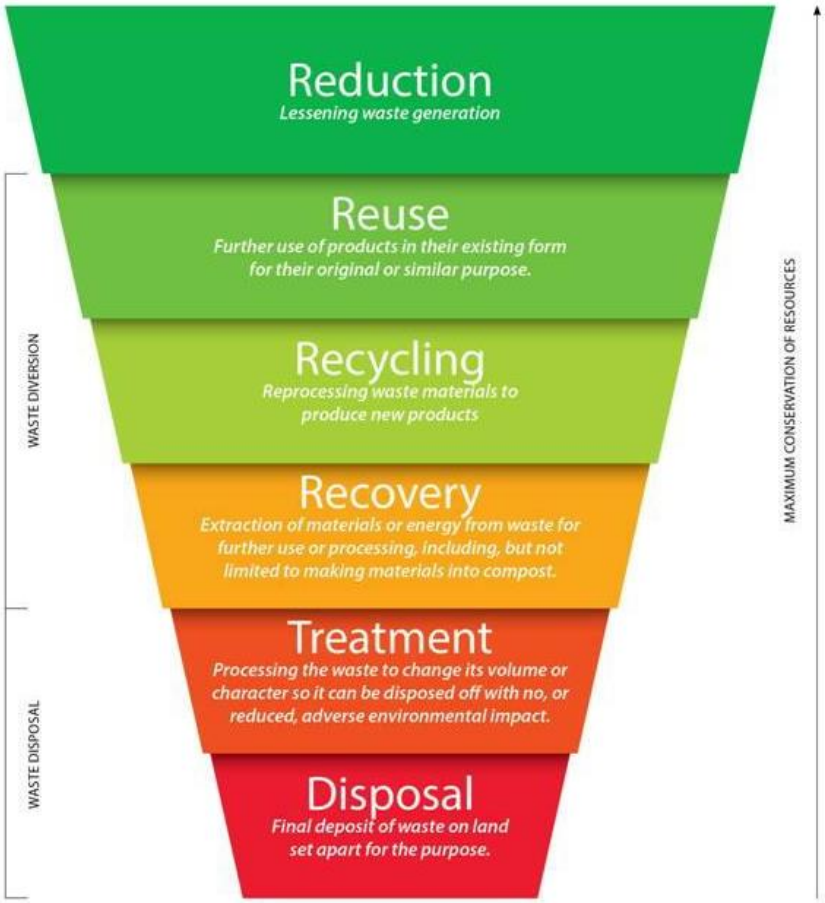


Plate 1 – Waste Hierarchy

1.2. 15 STEPS

1.2.1.1. The following section outlines the 15 steps of the Outline SWMP. These steps provide a framework and should be developed further by the nominated Appointed Contractor once appointed and when further information is available.

1.2.2. STEP 1: ADMINISTRATION AND PLANNING

1.2.2.1. Step 1 identifies basic information about the project and the key individuals involved. This includes both Client and the Appointed Contractor(s).

1.2.3. STEP 2: ACTION LOG

1.2.3.1. The Action Log provides a framework for recording the outcome of project meetings on waste management. An Action Log will help to maintain a record of agreed actions throughout the projects and therefore, will inform waste forecasts.

Table 1 - Action Log

Action Log	Date	Organiser	Attendance Record (name & company)	Notes taken by	List of Actions

1.2.4. STEP 3: KEY PERFORMANCE INDICATORS AND TARGETS

1.2.4.1. Step 3 provides a means to report progress against a series of KPIs. The Appointed Contractor is responsible for establishing a series of KPI's based on UK industry standards outlined in Table 2.

1.2.4.2. Waste Operators will be asked at the tender stage to outline how they will achieve above the UK industry standards and will be required to report monthly on the KPI's in Table 2.

Table 2 – Key Performance Indicators

KPIs
Amount of excavated material produced
Amount of excavated material recycled
Amount of excavated material sent to landfill
Amount of construction waste produced
Amount of construction waste recycled

Amount of construction waste sent to landfill
Total amount of waste produced
Total amount of waste recycled
Total amount of waste sent to landfill
Amount of waste classified as hazardous, including proportion resulting from contaminated soils
Amount of contaminated soil cleaned

1.2.5. STEP 4: DESIGN MEASURES AND COST SAVINGS FROM DESIGN

1.2.5.1. The following step is to enable the recording of all waste reduction opportunities adopted during design. Table 3 below records a series of design decisions and helps quantify the impact of these.

Table 3 – Design Measures

Nature of Project		
Primary Waste Stream	Opportunity for Waste Reduction	Implemented? (If not why?)
Design		
Construction Method		
Materials Employed		

1.2.6. STEP 5: RESPONSIBILITIES FOR WASTE MANAGEMENT

1.2.6.1. Step 5 documents the waste management responsibilities. It is vital for the SWMP to be successfully implemented, that key roles and responsibilities for waste management are clearly defined, documented and communicated.

1.2.6.2. The Client is responsible for the production of the Proposed Development's SWMP via instruction to the Project Manager, with the Appointed Contractor(s) responsible for developing and maintaining the project SWMP and for making available the necessary resources to ensure that the SWMP is fully implemented. A series of key roles have been identified and are as follows:

The Client

1.2.6.3. The Client understands the responsibility to prepare a SWMP for the project, and that it is passed down to the Design Team(s) and Appointed Contractor(s) using the SWMP template and standards. The resulting SWMP will then form part of the contract between the Client and the relevant personnel/organisations involved in the project (see Tables 4 and 5).

1.2.6.4. The project roles are set in Table 4 below.

Table 4 - Project Roles

Responsibility	Actions
Client	Instruct the Design Team to initiate a suitable SWMP/ data to be collated at tender stage.
Client	Instruct the Appointed Contractor for the project.
Client	Review and approve targets suggested by the Appointed Contractor.
Client	Sign off of the project once completed in conjunction with the Appointed Contractor.
The Project Manager	Coordinate the estimation of total volumes of waste expected to be generated by the project with the Appointed Contractor, and relay and review the targets with the Client.
The Project Manager	Identify key SWMP related issues to contractors at Tender stage, including

	information required to complete the site waste matrix.
The Project Manager	Effective relay of the SWMP to the Appointed Contractor to enable successful implementation of the SWMP on site.
The Appointed Contractor / The Project Manager	Estimation of the total volumes of waste expected to be generated by the project with the Project Manager, and the setting of targets relating to reuse, recycling, and disposal of wastes on and off site prior to approval by the Environmental Manager.
The Appointed Contractor	Ensuring suitable resources are made available during the construction phase in relation to working towards the requirements of the SWMP.
The Appointed Contractor	Ensuring the implementation and ongoing monitoring of the SWMP.
The Appointed Contractor	Ensuring, so far as is reasonably practicable, that waste produced during construction is reused, recycled or other form of recovery.
The Appointed Contractor	The production and issue of the site waste matrix and implementation of the Site Waste Policy.
The Appointed Contractor	Signing Waste Transfer Notes and assigning responsibility for this to nominated persons on site in their absence.
The Appointed Contractor	The identification and support of a suitable Waste Champion who will deal with the ongoing monitoring and enforcement of the SWMP at an operational level.

The Appointed Contractor	Ensuring the collation of data relating to waste management and the input of data into the nominated monitoring tool.
The Appointed Contractor	The sign off of the project once completed with the Client.
The Appointed Contractor	So far as is reasonably practicable, ensure coordination of the work and cooperation amongst contractors at work during the construction phase.
The Appointed Contractor	The Appointed Contractor must: Plan, manage, monitor and coordinate the entire construction phase Take account of the health and safety risks to everyone affected by the work (including members of the public), in planning and managing the measures needed to control them Liaise with the client and principal designer for the duration of the project to ensure that all risks are effectively managed Prepare a written construction phase plan PDF before the construction phase begins, implement, and then regularly review and revise it to make sure it remains fit for purpose Have ongoing arrangements in place for managing health and safety throughout the construction phase Consult and engage with workers about their health, safety and welfare Ensure suitable welfare facilities are provided from the start and maintained throughout the construction phase

	Check that anyone they appoint has the skills, knowledge, experience and, where relevant, the organisational capability to carry out their work safely and without risk to health Ensure all workers have site-specific inductions, and any further information and training they need Take steps to prevent unauthorised access to the site Liaise with the principal designer to share any information relevant to the planning, management, monitoring and coordination of the pre-construction phase
The Appointed Contractor	Must make and maintain arrangements that will enable the workers engaged in the construction work to cooperate effectively in promoting and developing measures to ensure that any waste arising on site is managed within the terms of the SWMP and in checking the effectiveness of such measures.
Principal Designer, Client and Appointed Contractor	The Principle Designer is to liaise directly with the Client and Appointed Contractor regarding Health & Safety related issues and the SWMP.
Waste Champion	The effective communication of the SWMP to their operatives and ensures enforcement of the SWMP at an operational level e.g. identifying areas for improvement where segregation is not being followed.
Waste Champion	For the delivery of relevant toolbox talks where necessary.

1.2.6.5. Table 5 below will require completion once the Appointed Contractor is appointed and subcontractors known as the majority of projects are delivered by a range of sub-contractors, each of which will need to manage their waste in line with the project SWMP. The table below provides a framework to be developed by the Appointed Contractor to allocate responsibility to individuals/ organisations for different elements of the work.

Table 5 – Assignment of waste management responsibility by site activity/sub-contractor (once appointed)

Site Activity/ Sub contractor workplace	Primary waste stream	EWC Code	Waste Management responsibility	Relevant Specification/ Contract Clause for Waste Management
Groundworks				
Foundations, Piling				
Structure				
Dryliners				
Building Envelope/Cladding				
Mechanical Electrical				
Trades (Joinery, painting, Plastering, Rendering, Plumbing, Heating etc.)				
Landscaping & habitat creating/ restoration				
Removal of site offices, temporary works & final clear away				
Cable civils and Cabling works (installation and jointing / terminating and HDD)				

1.2.7. STEP 6: COMMUNICATION, TRAINING AND DISTRIBUTION OF THE SWMP

1.2.7.1. Copies of the SWMP will be made available to all principal and sub-contractors at tender stage for reference. The SWMP will also assist in defining terms and conditions through the implementation and monitoring of this plan relating to waste management on site during the project lifetime. In addition to these key project partners, the Construction Design Manager ('CDM') coordinator will have full access to this SWMP in order for comments to be made with regard to any additional Health and Safety requirements envisaged as part of the development of this project.

1.2.7.2. A waste planning meeting will be scheduled for all key project team members (see distribution list) at the tender stage to formulate a waste management strategy to optimise best practice waste management through the lifetime of the project.

Date Waste Planning Meeting set	___/___/___
Date Waste Planning Meeting held	___/___/___

1.2.7.3. A copy of the latest version of the SWMP will be displayed in a prominent location on site including the site office and the signing in area (if applicable).

1.2.7.4. Training and communication of this SWMP will be made by the following means:

- Within the Appointed Contractor's site induction;
- Formal training course on waste management; or
- The delivery of Toolbox Talks by Principal/ Sub Contractor or waste champion.

1.2.7.5. Training and communication will be provided to all personnel working on the project. This will be implemented in order to highlight the importance of the SWMP and individual responsibility in ensuring effective waste minimisation and management on site.

1.2.7.6. The Appointed Contractor is responsible for the distribution of the latest version of the SWMP to all parties on the distribution list. Each will be responsibility for distributing updated versions and removing superseded copies (hard and electronic format) in their particular work field. The Appointed Contractor must ensure that every contractor knows where the SWMP is kept, and must make it available to any contractor carrying out work described in the plan.

1.2.8. STEP 7: FORECASTING WASTE PRODUCTION AND PLANNING REUSE AND RECYCLING

1.2.8.1. Step 7 forecasts the waste streams, sub divided by material type (inert, non-hazardous and hazardous) and project phase (e.g. enabling, construction). Waste forecasting is an essential part of the SWMP. Forecasting waste allows a clear strategy to be established to effectively manage the waste.

1.2.8.2. The Client and Project Team shall investigate all likely waste streams to be generated from this project, approximate volumes of material and assigned relevant targets. Targets will set by the Appointed Contractor (with final approval by the Environmental Manager/Waste Champion) and will go beyond the UK industry standards to maximise reuse and recycling of material both on and offsite, and opportunities for both financial savings and environmental sustainability.

1.2.8.3. Table 6 shall be completed by the Appointed Contractor once appointed including type of each material, the volume of that material, the % target from diversion to landfill and the method of treatment or disposal.

Table 6 - Waste Forecasts

Waste Category	Type of Material	Estimated volume	% Target	Method of treatment/ disposal
Enabling Works and Reinstatement				
Inert				
Non-hazardous				
Hazardous				
–Construction Works				
Inert				
Non-hazardous				
Hazardous				

1.2.8.4. The assessment shall include site generated wastes (e.g. arisings and construction specific waste such as concrete break out/ re-bar) and imported waste materials (e.g. imported secondary aggregates/ soils from other client or third-party construction sites).

1.2.8.5. The project team shall ensure the principles of the Waste Hierarchy will be applied to the SWMP to enable best practice onsite to improve the overall sustainability of the project. It is intended that the SWMP should evolve during the course of the project. Regular monitoring and reviews will be undertaken (see Section 1.7) to ensure continual improvement, legal compliance and that cost-effective solutions are in place.

Recycling & Reuse Initiative

1.2.8.6. As part of the development of the SWMP the Appointed Contractor and Project Team shall review and agreed upon initiatives to reduce the amount of waste produced in the first instance, and assisting in the recycling and reuse of waste as an alternative to offsite disposal as outlined in Table 7.

Table 7 - Recycling & Reuse Initiatives

Material	Legislation/ Notes
Recycling Offsite	
Plastic packaging	
Paper & Cardboard	
Plasterboard via British Gypsum/ Knauf	
Concrete wastes (processed)	
Recycling Onsite	
Concrete waste (processed)	Environmental Permit Regulations 2010. Schedule 3. Chapter 2*. i.e.: -Use waste under exemption U8; -Treat waste to make it suitable for use in construction under exemption T5; -Treat bricks, tiles, concrete by crushing T7.

	* if not in this chapter will require permit.
Reuse Onsite	
Arisings, uncontaminated[1]	Environmental Permit Regulations 2010
Wood	

[1]If the excavated material does not prove to be contaminated in accordance with the WAC testing and Soil Guideline Values (SGVs), then there are a number of reuse and recycling opportunities that exist.

1.2.9. STEP 8: WASTE STORAGE AND DISPOSAL OPTIONS

1.2.9.1. Suitable waste storage facilities/arrangements must be made onsite to ensure effective segregation of wastes onsite to aid higher rates of recovery (e.g. through recycling or reuse initiatives. See Section 1.4).

1.2.9.2. The placing of waste management contracts will, where possible, consider the implications of long distance travel in terms of health and safety risk, commercial terms and increased emissions from vehicles. Wherever possible, contracts will be awarded as locally as possible.

1.2.9.3. It is essential that the construction work is carried out closely with the waste management contractors, in order to determine the best techniques for managing waste and ensure a high level of recovery of materials for recycling.

1.2.9.4. A specific area shall be laid out and labelled to facilitate the separation of materials for potential recycling, salvage, reuse and return. Recycling and waste bins are to be kept clean and clearly marked in order to avoid contamination of materials. Skips for segregation of waste identified currently are:

- Metal (e.g. copper and iron);
- Inert (e.g. inert plastics, concrete and rubble);
- Hazardous (e.g. asbestos, Poly Chlorinated Bi-phenols);
- Mixed non-hazardous (biodegradable waste); and
- Waste Electrical and Electronic Equipment ('WEEE').

1.2.9.5. All waste management contracts are listed within the Waste Carrier and Destination Register in Table 8. This is to be updated regularly with any additional service providers, changes in destination sites or additional waste streams being generated. The responsibility for ensuring the register is completed and kept up to date is with the Appointed Contractor.

1.2.9.6. Both the Client and Appointed Contractor will take reasonable steps to ensure site security measures are in place to prevent illegal disposal of waste at the site.

1.2.10. STEP 9: REGISTER OF LICENCES, PERMITS AND MOVEMENTS

1.2.10.1. This step documents the tracking of waste carriers and waste destinations, which are mandatory to comply with the Environmental Protection Act 1990.

1.2.10.2. The Environmental Permitting (England and Wales) Regulations 2016 require that disposal sites are classified into one of three categories dependent on the chemical composition of the material; these are hazardous, non-hazardous and inert. Prior to disposal, if material is deemed hazardous it must be pre-treated to meet the Waste Acceptance Criteria. Further stipulations within the Environmental Permitting Regulations 2016 are as follows:

- Higher engineering and operating standards to be followed;

- Hazardous liquids, flammable, corrosive, explosive, oxidising and infectious wastes have been banned from landfill since July 2002;
- Non-hazardous liquids have been banned since 2007;
- Co- disposal has been banned since 16 July 2004;
- Whole tyres were banned from 2003, and shredded tyres have been banned since 2006;
- Waste will be required to be pre-treated prior to landfilling; and
- Operators must demonstrate that they and their staff are technically competent to manage the site, and have made adequate financial provision to cover the maintenance and aftercare requirements.

Table 8 – Waste Carrier and Destination Register

Waste		Waste Carrier			Waste Management Facility					
Waste type and EWC code	Person responsible for disposal	Name of waste carrier	Waste carriers licence no. & expiry date	Validated with EA?	Disposal site name & address	Type of facility (e.g. landfill, transfer station or exempt site)	% recycled	Environmental permit no. or permit exemption no. (& expiry date)	Validated with EA?	Waste type and EWC code
Enabling Works and Reinstatement										
Notes:										
Arisings **17-05-04**	J.Bloggs	R. Plant Hire	SSU/458637/CB 12/05/2008	✓	Foxes Quarry. Daventry Road, Bristol, BS2 3BB	Landfill	10%	45731	✓	Site office

Construction Works										
Notes:										

1.2.11. STEP 10: MONITORING & MEASUREMENT

1.2.11.1. Step 10 ensures that the project is being monitored throughout construction.

1.2.11.2. The effectiveness of the SWMP will depend upon the enforcement of its requirements on site and include monitoring to be made by the Waste Champion and Site Manager on site. Responsibility for the formal recording of all waste movements shall be with the Site Manager and is to be recorded on a weekly basis using an approved nominated system (e.g. weekly monitoring sheet). It is the responsibility of the Appointed Contractor to ensure the data is collated and that this is inputted into the nominated monitoring tool, and that all waste transfer notes/ Hazardous waste consignment notes are forwarded to the waste champion weekly.

1.2.11.3. A 'spot check' will be made by the Site Manager in relation to the completeness of the weekly monitoring sheet, any waste transfer note and any hazardous waste consignment note against the Waste Carrier and Destination Register. (see Table 9). This will ensure both the accuracy of data entered in to the monitoring tool.

1.2.11.4. The skips will be monitored to ensure that cross-contamination of segregated skips does not occur. This will be covered in the toolbox talks – reviewing how the onsite waste management system is working and point out the extra costs associated with contamination. The Appointed Contractor will continually review the type of surplus materials being produced and change the site set up to maximise on reuse or recycling and the use of landfill will be the last option.

1.2.11.5. If any problems are identified during the lifetime of the project in relation to exceeding the expected SWMP waste stream volumes, failure to meet stated targets or issues relating to cost effective and legal transfer of waste materials, then they are to be escalated to the Project Manager for further discussion on the best solution. This may trigger a review of the SWMP in relation to adjustment of targets, however, any change would need to be documented and justified.

Table 9 - Deviations

Issue	Details
[waste forecast – exceeded]	
[waste forecast – not met]	

1.2.11.6. The SWMP will be reviewed at least every six months (but monthly is recommended) during the lifetime of the project by the Project Manager and the Appointed Contractor to ensure that estimated targets are being achieved and that realistic solutions are provided for unplanned events or abnormal wastes.

1.2.12. STEP 11: ACTUAL WASTE ARISINGS

1.2.12.1. This step provides a framework for recording the actual waste arisings from the project, allowing a comparison with earlier estimates. Actual waste quantities will be obtained from the monthly reports. These will be spot checked against paper Waste Transfer Notes.

1.2.12.2. The Environmental Permitting Regulations 2016 also require that waste is described by European Waste Catalogue ('EWC') codes on Transfer Notes required under the Duty of Care Regulations. The EWC categorises wastes into 20 main groups and approximately 900 codes. The EWC also identifies Hazardous Wastes, many of which are currently Special Waste and dealt with by the Special Waste Regulations, but some of which are not, such as fluorescent tubes, certain batteries and cathode ray tubes.

1.2.13. STEP 12: PROJECT COMPLETION

1.2.13.1. Upon completion of the project, the Client and Appointed Contractor(s) will review the SWMP and ensure that it is updated to and review the targets originally set.

1.2.14. STEP 13: OVERALL RECYCLED CONTENT

1.2.14.1. Step 13 is not a requirement of the SWMP Regulations 2008, although it demonstrates the project is meeting requirements for recycled content as defined by the KPI's for total amount of waste recycled, amount of excavated material recycled and amount of construction waste recycled.

1.2.15. STEP 14: IMPLEMENTATION

1.2.15.1. Step 14 provides a checklist to ensure that the necessary arrangements have been made to ensure effective SWMP implementation on site as presented in Table 10. This includes additional tasks outlined in the SWMP Regulations 2008 to ensure the effective operation, monitoring and reporting of the SWMP.

1.2.15.2. Prior to implementation of the SWMP, the Site Manager(s) or Appointed Contractor(s) should complete all necessary checks as outlined in the worksheet below. The checklist covers recommended best practice actions.

1.2.15.3. The checklist should be signed off by the Client and Appointed Contractor(s) every time the SWMP is updated.

Table 10 – SWMP Checklist

	Yes	No	Section
Client Checks			
The Client should give reasonable directions to any contractor to enable the Appointed Contractor(s) to complete the SWMP.			Section 1.2.6
Appointed Contractor(s) Checks			
The Appointed Contractor(s) should ensure that so far as reasonably practical coordination of the work and cooperation among contractors at work during the construction phase.			Section 1.2.6
The Appointed Contractor(s) should ensure that so far as reasonably practical every worker carrying out construction work is provided with a suitable site induction.			Section 1.2.6
The Appointed Contractor(s) should ensure that so far as reasonably practical every worker carrying out construction work is provided with any further information and training needed for the particular work to be carried out within the terms of the SWMP.			Section 1.2.6

The Appointed Contractor(s) should make and maintain arrangements which will enable the Appointed Contractor and workers to engage in construction work to cooperate effectively in promoting and developing measures to ensure any waste arising on site is managed within the terms of the SWMP and in checking the effectiveness of such measures.			Section 1.2.6, 1.2.7, 1.2.8
The Appointed Contractor(s) should ensure so far as reasonably practical that waste produced during construction is reused, recycled or recovered.			Section 1.2.8
Have terms and commercial rates been agreed with waste management contractors?			Section 1.2.8, 1.2.9
Have data reporting procedures been agreed with waste management contractors?			Section 1.2.10
For offsite waste management or disposal- Are all the waste destination details verified?			Section 1.2.8
Has a waste segregation/collection area been prepared?			Section 1.2.9
Has the waste management area been adequately sign posted?			Section 1.2.9
Has a waste management planning meeting been set?			Section 1.2.7
Has the waste management document control/ filing system been set up?			Section 1.2.7, 1.2.11

Have all necessary staff and contractors read and signed the SWMP?			Section 1.2.6
Have the waste management targets/ KPIs been set?			Section 1.2.4
Has the SWMP been approved by the Client?			Section 3.6
Client & Appointed Contractor(s) Checks			
Have the Client and Appointed Contractor(s) reviewed, revised and refined the SWMP as necessary, and ensured that any changes in respective roles and responsibilities are clearly communicated to those affected?			Section 1.2.6, 1.2.7
Have the Client and Appointed Contractor(s) taken reasonable steps to ensure sufficient site security measures are in place to prevent the illegal disposal of waste?			Section 1.2.9

1.2.16. STEP 15: DOCUMENT DECLARATION

FINAL SIGN OFF:		
By signing this box, I confirm that I have understood the content and requirements outlined in this document.		
Appointed Contractor(s)	../../….	
Client	../../….	

1.3. SITE WASTE MANAGEMENT GUIDANCE

1.3.1. INTRODUCTION

1.3.1.1. The following section acts to serve as guidance to all persons involved in the waste management of the project proposals.

1.3.2. CLASSIFICATION OF WASTE

1.3.2.1. The overarching requirement of classifying waste is to ensure that it is adequately described such that it can be disposed of at the appropriate disposal facilities. The responsibility for classification of waste resides with the producer of the waste, this could be classed as the Client or the Appointed Contractor, and will depend upon the specific circumstance.

1.3.2.2. Waste Transfer Notes and Hazardous Waste Consignment Notes must contain a written description of the waste and also a specific six figure code from the European Waste Catalogue ('EWC') (implemented in the UK by the List of Wastes (England) Regulations 2005 (SI 2005 No. 895). The EWC is a list of wastes divided into 20 chapters. Chapter 17 is the most relevant section for classifying waste produced on construction sites.

Inert Waste

1.3.2.3. Inert Waste is waste that does not:

- Undergo any significant physical, chemical or biological transformations;
- Dissolve burn or otherwise physically or chemically react;
- Biodegrade or adversely affect other matter with which it comes into contact; and
- its leachability is insignificant.
- Examples include: Glass, concrete, bricks, tiles, and arisings excluding peat and topsoil).

Non- Hazardous Waste

1.3.2.4. Non-hazardous waste is simply defined as waste that is not hazardous waste, which does not feature on the list of hazardous waste in the EWC. Examples include general mixed construction waste.

Hazardous Waste

1.3.2.5. Waste is generally considered to be hazardous if it (or material or substances it contains) could cause harm to humans or the environment (e.g. asbestos, batteries and solvents) (UK Government, n.d.).

1.3.2.6. Should you produce or hold hazardous waste the following steps must be followed:

- Waste must be classified to check if it is hazardous;
- Waste must be separated and stored safely;
- Authorised businesses must be used to collect, recycle and dispose of your waste (check that waste carriers are registered and waste sites have environmental permits);
- Fill in the parts of a Waste Consignment Note ('WCN') that apply to you (keeping one copy and giving two copies to the carrier collecting the waste); and
- Keep a register for 3 years at the premises that produced or stored the waste.

1.3.2.7. Each movement of hazardous waste has to be accompanied by a Hazardous Waste Consignment note (see Plate 3). These must be uniquely referenced but otherwise contain the same information as a standard WTN. To fill this out you will need to know the Standard Industrial Classification (SIC code (2007) which describes the business activity that produced the waste and the Waste Classification Code referred to as LoW (List of Waste) or WC (European Waste Catalogue) code which describes the waste.

1.3.2.8. Guidance on determining whether material is hazardous is provided in Technical Guidance WM2: Hazardous waste – Interpretation of the definition and classification of hazardous waste. It outlines the methodology for assessing wastes, determination of dangerous substances within waste and provides a hazardous waste assessment methodology.

1.4. WASTE ACCEPTANCE CRITERIA

1.4.1.1. Before waste can be accepted by a landfill, the operator must be able to show that it can be accepted in accordance with its Waste Acceptance Criteria ('WAC') (Environment Agency, 2011). Under this regime, it is the waste producer that has the responsibility for basic characterisation which uses a standard suite of leachate testing to ascertain the potential for the wastes to cause water pollution. There are published maximum leachate criteria for the following categories of waste, and are available from the landfill site you intend to use.

- Hazardous waste (numerical limits for leachable substances and organic content, along with standards for physical stability);
- Non-reactive hazardous waste;
- Non-hazardous waste (no numerical limits for non-hazardous waste); and
- Inert waste.

1.4.1.2. Certain materials meet the definition of inert waste without the need for further analysis or need for testing to show they meet the WAC for inert landfill sites. These are outlined in Table 11 as follows:

Table 11 – Inert Wastes not requiring WAC

Description	Exclusions	EWC code
Waste glass		10 11 12
Waste glass based fibrous materials		10 11 03
Glass packaging		15 11 07
Concrete		17 01 01
Bricks		17 01 02
Tiles and ceramics		17 01 03
Glass		17 02 02 20 01 02
Soil and stones		20 02 02

1.4.1.3. All other waste needs to meet the total chemical concentration and leachability levels of the WAC and therefore will need to be tested. It should be noted that individual landfill sites may have additional acceptance criteria to the standard WAC and consequently operators should be consulted before finalising the decision on disposal site.

1.5. DISPOSAL AND MOVEMENT OF WASTE OFFSITE

1.5.1. TRANSFER OF WASTE

1.5.1.1. When removing waste from site, a waste transfer note (or consignment note for hazardous wastes) must be completed prior or at the point of removal from any site as specified in the Waste (England and Wales) Regulations 2011 (See Plate 2). Waste Transfer Notes must be used for all shipments of inert and non-hazardous wastes. These documents are completed in three parts and include details for the following three parties: waste producer; waste carrier; and receiving site. The following details must be included on all Waste Transfer Notes:

- Producer site address;

- Written description of waste and EWC code;
- The quantity of waste and how it is contained (e.g. 8-yard skip);
- Waste carrier details and licence number;
- Receiving site address and licence number; and
- Confirmation that the holder of waste has fulfilled their duties under the waste hierarchy.

1.5.1.2. However, if the waste composition changes (e.g. degree of contamination, or different type of waste), or it is to be sent to a different site, or moved by a different carrier, then a new Waste Transfer Note has to be completed.

1.5.2. PRE-TREATMENT

1.5.2.1. If the material is non-hazardous and it is destined for disposal directly to landfill, pre-treatment must have been applied and a declaration detailing the treatment applied attached to the Waste Transfer Note.

1.5.2.2. All hazardous and non-hazardous wastes will be pre-treated prior to disposal to landfill. The methods of pre-treatment will enable the waste to meet the 'three-point test' as follows:

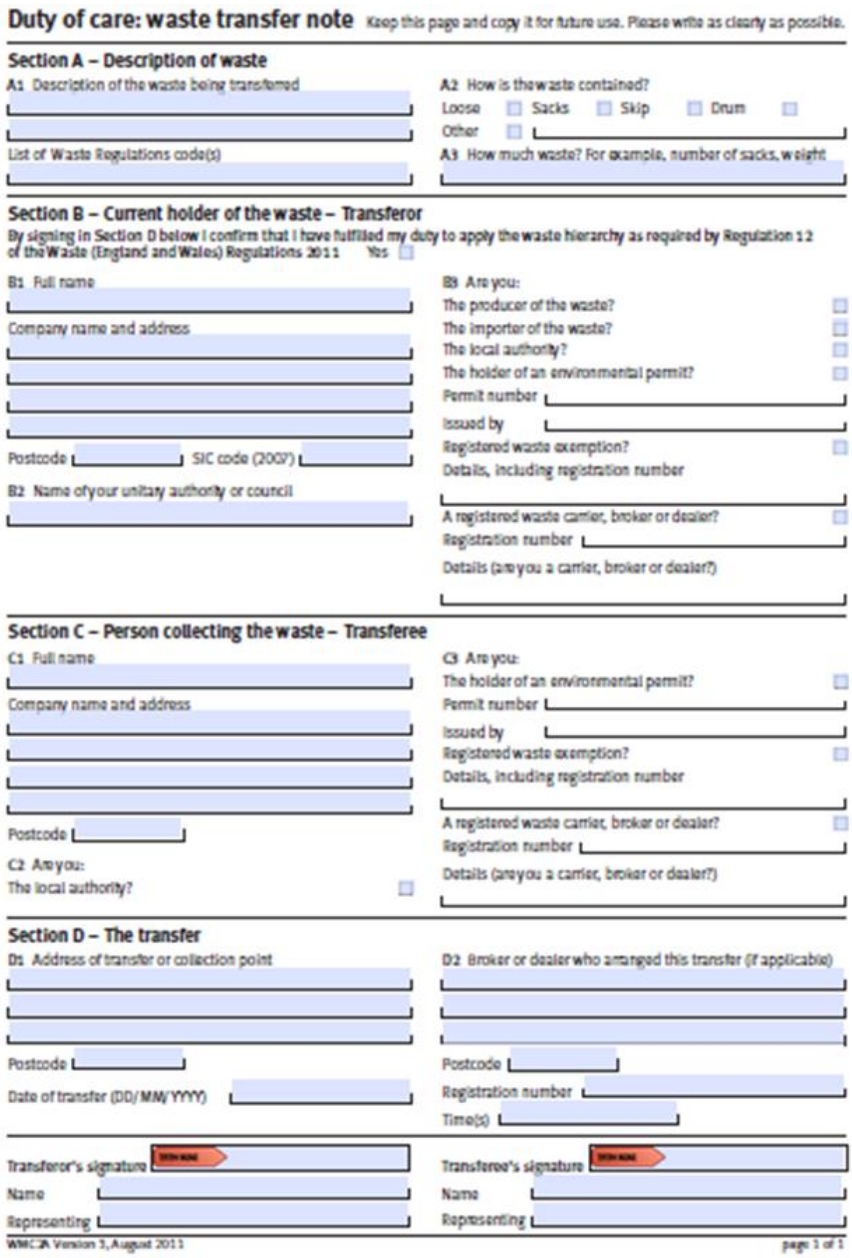
- It must be a physical, thermal, chemical or biological process (including sorting);
- It must change the characteristic of the waste;
- It must do so in order to:

1.5.2.3. Reduce its volume; or

- Reduce its hazardous nature; or
- Facilitate its handling, or
- Enhance its recovery.

1.5.2.4. Source segregation is seen as a pre-treatment option. This can be applied to waste generation on site, including general waste and arisings.

1.5.2.5. A declaration stating the pre-treatment method applied to the waste must be attached to any WTN for non-hazardous waste being disposed of to a landfill, the Appointed Contractor's Site Manager will ensure this accompanies the WTN.



Duty of care: waste transfer note Keep this page and copy it for future use. Please write as clearly as possible.

Section A – Description of waste

A1 Description of the waste being transferred

List of Waste Regulations code(s)

A2 How is the waste contained?
Loose ☐ Sacks ☐ Skip ☐ Drum ☐
Other ☐

A3 How much waste? For example, number of sacks, weight

Section B – Current holder of the waste – Transferor

By signing in Section D below I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011 Yes ☐

B1 Full name

Company name and address

Postcode SIC code (2007)

B2 Name of your unitary authority or council

B3 Are you:
The producer of the waste? ☐
The importer of the waste? ☐
The local authority? ☐
The holder of an environmental permit? ☐
Permit number
Issued by
Registered waste exemption? ☐
Details, including registration number
A registered waste carrier, broker or dealer? ☐
Registration number
Details (are you a carrier, broker or dealer?)

Section C – Person collecting the waste – Transferee

C1 Full name

Company name and address

Postcode

C2 Are you:
The local authority? ☐

C3 Are you:
The holder of an environmental permit? ☐
Permit number
Issued by
Registered waste exemption? ☐
Details, including registration number
A registered waste carrier, broker or dealer? ☐
Registration number
Details (are you a carrier, broker or dealer?)

Section D – The transfer

D1 Address of transfer or collection point

Postcode

Date of transfer (DD/MM/YYYY)

D2 Broker or dealer who arranged this transfer (if applicable)

Postcode

Registration number

Time(s)

Transferor's signature

Name

Representing

Transferee's signature

Name

Representing

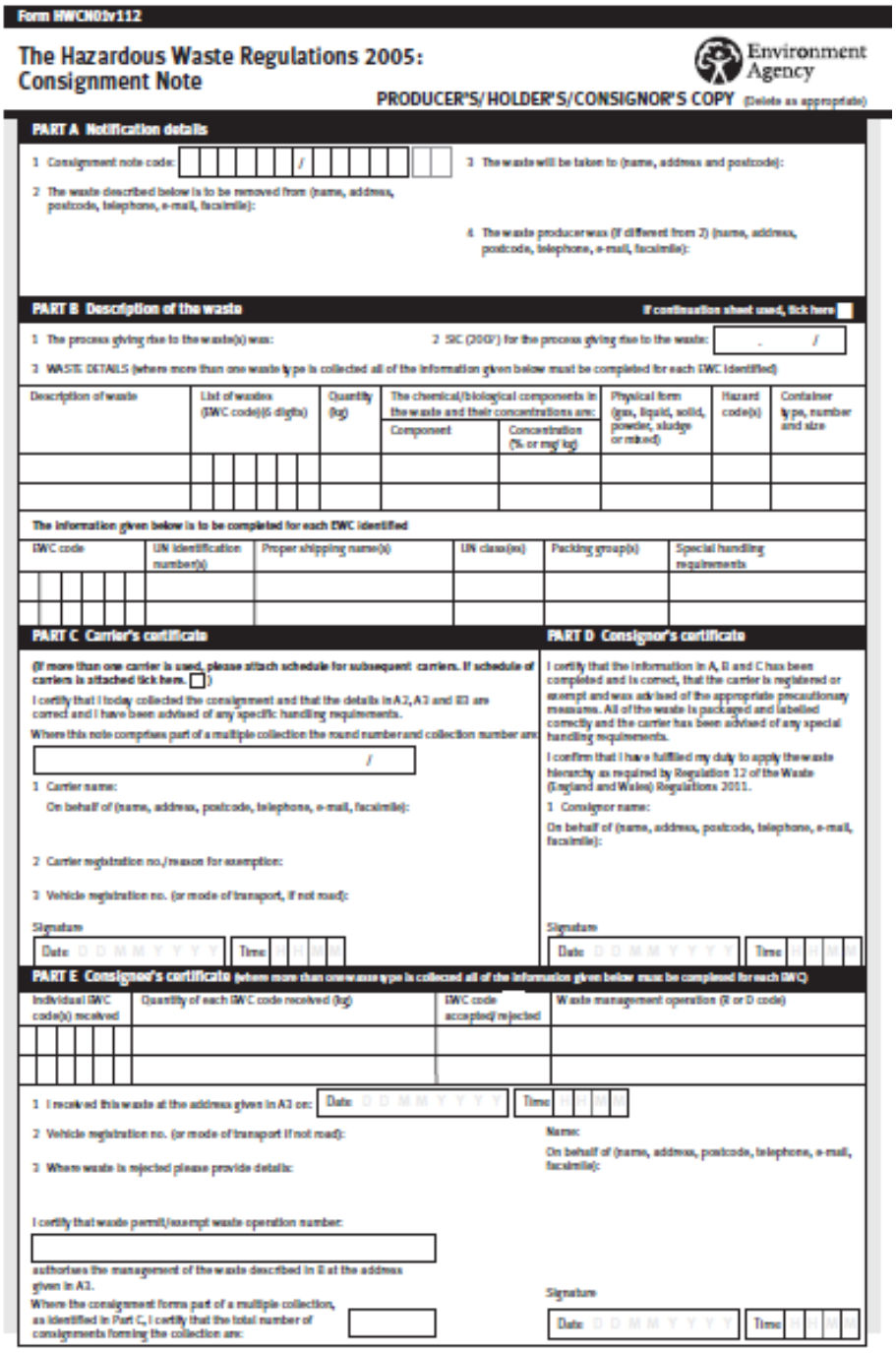
WMC2A Version 3, August 2011 page 1 of 1

Plate 2 – Waste Transfer Note Form

1.5.3. HAZARDOUS WASTE CONSIGNMENT NOTES

1.5.3.1. Hazardous Waste Consignment Notes must contain all the information identified above in section 1.4.11 for standard Waste Transfer Notes, however, they must also contain the following elements:

- Hazardous Waste Producer Premise Code;
- Details of what makes the consignment note hazardous;
- % concentration of contaminant; and
- The relevant hazard code (H1-H14).



Form HWCN01v112

The Hazardous Waste Regulations 2005: Consignment Note

Environment Agency

PRODUCER'S/ HOLDER'S/CONSIGNOR'S COPY (Delete as appropriate)

PART A Notification details

1 Consignment note code: / 3 The waste will be taken to (name, address and postcode):

2 The waste described below is to be removed from (name, address, postcode, telephone, e-mail, facsimile):

4 The waste producer was (if different from 2) (name, address, postcode, telephone, e-mail, facsimile):

PART B Description of the waste If continuation sheet used, tick here ☐

1 The process giving rise to the waste(s) was: 2 SIC (2007) for the process giving rise to the waste: . /

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are: Component	Concentration (% or mg/kg)	Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements

PART C Carrier's certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are: /

1 Carrier name:

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

2 Carrier registration no./reason for exemption:

3 Vehicle registration no. (or mode of transport, if not road):

Signature

Date D D M M Y Y Y Y Time H H M M

PART D Consignor's certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name:

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

Signature

Date D D M M Y Y Y Y Time H H M M

PART E Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)

1 I received this waste at the address given in A3 on: Date D D M M Y Y Y Y Time H H M M

2 Vehicle registration no. (or mode of transport if not road):

3 Where waste is rejected please provide details:

Name:

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

I certify that waste permit/exempt waste operation number:

authorises the management of the waste described in E1 at the address given in A3.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of consignments forming the collection are:

Signature

Date D D M M Y Y Y Y Time H H M M

Plate 3 - Hazardous Waste Consignment

1.6. ENVIRONMENTAL PERMIT EXEMPTIONS

1.6.1.1. Environmental permit exemptions (detailed in Schedule 3 of the Environmental Permitting (England and Wales) Regulations 2016 have been developed to provide a lighter regulatory touch in order to promote the recovery of waste, as opposed to waste being disposed of directly to landfill. These exemptions take up to 25 working days to be approved, and each registration lasts 3 years. The relevant forms need to be completely by the Appointed Contractor to the Environment Agency.

1.7. LANDFILL TAX

1.7.1.1. The tax is charged by weight. There are 2 rates. You pay the lower rate on 'inactive waste' - for example rocks or soil. The lower rate is £2.90 per tonne (April 2019) and you pay the standard rate of £91.35 per tonne (April 2019) for 'active' waste. This rate is set to increase from the 1st April 2020 to £3.00 for inactive waste and to £94.15 for active waste.

Appendix 4 – Outline Materials Management Plan

Materials Management Plan (MMP) Form - October 2014

This form should be completed once the lines of evidence have been marshalled in relation to suitability for use, certainty of use and quantity required.

The answers to the questions posed within this form, together with the supporting information will constitute the MMP and must be provided to the Qualified Person.

A Qualified Person may comment on draft versions of this MMP, but will not complete the Declaration until all the relevant documents, demonstrating lines of evidence have been provided for each site.

The person / organisation who will pay the Declaration fee should confirm that they have read and understand the Terms and Conditions relating to the payment of the Declaration fee to CL:AIRE. These can be found on the CL:AIRE website.

The person / organisation agreeing to pay the Declaration Fee - Name, organisation and contact details inc. email address -	

☐ **I confirm I have read and understood the Terms & Conditions.**

Each question must be answered. If the question is not applicable please state this and provide a brief explanation.

1. Specify the scenario to which this MMP relates, as described in the Definition of Waste: Development Industry Code of Practice (DoW CoP) (1, 2, 3 or 4):

☐ 1. Reuse on the Site of Origin

☐ 2. Direct Transfer of clean naturally occurring soil / mineral materials

☐ 3. Cluster Project

☐ 4. Combination of any of the above

In the case of a combination of reuse scenarios, please describe it below (e.g. (i) Reuse on Site of Origin and Direct Transfer of clean naturally occurring unpolluted soils, (ii) Reuse on the Site of Origin with Direct Transfer of clean naturally occurring soil to x number of development sites etc:

(NB: A Declaration is required for reuse on the Site of Origin and for any 2 site arrangement i.e. there is no facility for a combination Declaration)

2. Organisation and name of person preparing this MMP	(Full address and contact details)

Document Control

Date issued	
Revision date	
Summary of revision 1	
Summary of revision 2	

Insert additional lines to the table above for any subsequent revisions.

Note - revisions to the MMP do not trigger an additional Declaration by a Qualified Person, unless an additional site is added to the project.

Revisions to the MMP must be recorded and summarised in the Document Control box above.

Site Details

3. Site / Project name(s)	
Reuse / receiving site name :	
Donor site name (if Direct Transfer)	

Landowners

4a. Name of Landowner(s) (full address and contact details) – where excavated materials are to be reused	
4b. Name of Landowner(s) (full address and contact details) – where excavated materials are arising from	

Summary and objectives

5a. Provide a brief description of the planned project and how excavated materials are to be reused.	

General Plans and Schematics

6. **Attach** a location plan for the site(s) and a plan of the site(s) which identifies where different materials are to be excavated from, stockpile locations (if applicable), where materials are to be treated (if applicable) and where materials are to be reused.	Plan Document Reference(s):

7. **Attach** a schematic of proposed materials movement. Where there is only one source area and one placement area briefly describe it. For all other projects a schematic is required.	Description & Schematic Document Reference:

Parties Involved and Consultation – if more than one party please provide additional details for them and identify the location that they will be working e.g. where a site is zoned

8a. Main earthworks contractor(s) (full address and contact details) – Where excavated materials are to be reused	
8b. Main earthworks contractor(s) (full address and contact details) - Where excavated materials are arising from	

9. Treatment contractor(s) (full address and contact details) – for treatment on site of origin, or at a Hub site within a fixed STF / Cluster Project	

10. Where wastes and materials are to be transported between sites, provide details of the transport contractor(s) (full address, contact details and waste carriers registration details (if applicable))	

11. Provide Local Authority contact details (full address and named contacts) where excavated materials are to be reused	

12a. For the site where materials are to be reused and for Hub Site locations provide Environment Agency contact details (full address and named contacts):	
For all Cluster Projects: 12b. Attach any relevant documentation	EA references:

from the EA relating to the excavation and reuse of the materials to demonstrate no objection to the proposals (see 3.37 of DoW CoP) If the EA has not been consulted please explain why (see paragraph 3.39 of the DoW CoP).	

Lines of Evidence

There is no one single factor that can be used to decide that a substance or object is waste, or when it is, at what point it ceases to be waste; as complete a picture as possible has to be created.

The following sections require completion to ensure the correct decision is made.

If a requested item is not relevant it is important to clearly state why this is so (e.g. no planning permission required because permitted development status exists).

Suitable for use criteria

13. Please describe or provide copies of the required specification(s) for the materials to be reused on each site.	Document Reference(s):

Where contamination is suspected or known to be present 14a. Please provide copies of or relevant extracts from the risk assessment(s) that has been used to determine the specification for use on the site. **This must relate to the place where materials are to be used.** This must be in terms of (i) human health (ii) controlled waters and (iii) any other relevant receptors. If a risk assessment is not relevant for a particular receptor given the site setting please explain why below:	Document Reference(s):
14b. Please attach any relevant documentation from the LA relating to the excavation and reuse of the materials to demonstrate no objection (see 3.37 of the CoP)	LA Document references:
14c. Please attach any relevant	EA Document references:

documentation from the EA relating to the excavation and reuse of the materials to demonstrate no objection (see 3.37 and Table 2 of the CoP)	
14d. Please attach any relevant documentation from any other regulators (if relevant) relating to the excavation and reuse of the materials to demonstrate no objection (see 3.37 of the CoP)	Document Reference(s):

Where contamination is not suspected 15a. Please attach copies or relevant extracts from the Desk Top Study that demonstrates that there is no suspicion of contamination.	Document Reference(s)
15b. Please attach copies of or relevant extracts from the site investigation/testing reports that adequately characterise the clean materials to be used (if appropriate).	Document Reference(s)
15c. Please attach copies of any other relevant information (if available) confirming that land contamination is not an issue.	Document Reference(s)

NB: It is your responsibility to assess the nature of the material to be used and that it fits within the limitations of the scenario under which it is to be used

Certainty of use

Various lines of evidence are required to demonstrate that the materials are certain to be used. This includes:

- The production of this MMP
- An appropriate planning permission (or conditions that link with the reuse of the said materials)
- An agreed Remediation Strategy(ies)
- An agreed Design Statement(s)
- Details of the contractual arrangements

Please identify in the following sections what lines of evidence relate to the site(s) **where the materials are to be used**.

16a. Planning Permission(s) relating to the site where materials are to be reused Please provide a copy of the relevant planning permission	Document Reference:
16b. Explain how the reuse of the excavated materials fits within the planning	

permission(s) for each site.	
16c. If planning permission is not required for any one site please explain why below e.g. permitted development, clean up of a chemical spill, surrender of an Environmental Permit, re-contouring within the existing permission.	

Where contamination is suspected or is known to be present 17. Please provide a copy of any Remediation Strategy(ies) that have been agreed with relevant regulators.	Document Reference(s):

Where contamination is not suspected 18. Please provide a copy of any Design Statement(s) that have been agreed (e.g. with the planning authority or in the case of permitted developments the client).	Document Reference(s):

Quantity of Use

19. Please provide a breakdown of the excavated materials for each site and how much will be placed at each site or sub area of each site. Where this is not specific to a single readily identifiable source refer to an annotated plan, schematic or attach a tabulated summary.	Document Reference(s):

20a. How has consolidation/compaction being considered in the above mass balance calculations?	
20b. How has loss due to treatment being considered in the above mass balance calculations (if applicable)?	
20c. How has the addition of treatment materials being considered in the above mass balance calculations (if applicable)? Note - An exact figure is not required but	

one that is reasonable in the circumstances and can be justified if challenged.	

Contingency arrangements

Explain what is to happen in the following situations and **identify the appropriate clauses** in the contract(s) (Such clauses must be provided to the Qualified Person, preferably as a summary document): or

21a. What is to happen to, and who is to pay for out of specification materials?	Reference:
21b. What is to happen to, and who is to pay for any excess materials?	Reference:
21c. What happens if the project programme slips in relation to excavated materials or materials under -going treatment?	Reference:
21d. Other identified risk scenarios for the project (relating to excavated materials)?	Reference:

The Tracking System

Where contamination is suspected or known to be present, state the procedures put in place to:

22a. For all sites please describe the tracking system to be employed to monitor materials movements.	
Where contamination is suspected or known to be present, state the procedures put in place to: 22b. Prevent contaminants not suitable for the treatment process being accepted	
Where contamination is suspected or known to be present, state the procedures put in place to: 22c. Prevent cross contamination of materials not in need of treatment, wastes awaiting treatment and treated materials	
Where contamination is suspected or known to be present, state the procedures put in place to: 22d. Demonstrate that materials that do not require treatment and successfully treated materials reach their specific destination	
Where contamination is suspected or known to be present, state the procedures put in place to:	

22e. Ensure that waste for off-site disposal or treatment is properly characterised and goes to the correct facility	

23. Please attach a copy of the tracking forms / control sheets that are to be used to monitor materials movements. To include transfer of loads on site into stockpiles prior to treatment (if applicable), stockpiled after treatment (if applicable), stockpiled awaiting use (as appropriate) and final placement.	Document reference(s)

For Hub Sites within Cluster Projects & where materials need treatment before reuse 24. Please attach a copy of the Environmental Permit covering the treatment process. Alternatively if the treatment is covered by a	Permit reference / EA letter reference:

Mobile Plant Permit and associated Deployment Form, attach a copy of the EA agreement to the Deployment Form.	

Records

25. Where, and in what form, are records to be kept? Note – records e.g. transfer notes, delivery tickets, Desk Top Study, Site Investigation, Risk Assessment(s), Verification Report(s) need to be kept for at least 2 years after the completion of the works and production of the Verification Report	

Verification Plan

26. Provide or explain the Verification Plan which sets out how you will record the placement of materials and prove that excavated materials have been reused in the correct location and in the correct	Document Reference

quantities within the development works (see 3.4 of the DoW CoP).	

Appendix 5 – Outline Soil Resources Plan

OUTLINE SOIL RESOURCES PLAN

1.1. INTRODUCTION

1.1.1.1. This Outline Soil Resources Plan ('Outline SRP') has been prepared on behalf of AQUIND Limited ('The Applicant') to support the application for a Development Consent Order ('DCO'). The application for the DCO is made in respect of the UK elements of AQUIND Interconnector Project which will operate between France and the UK.

1.1.1.2. The DCO Application for the UK elements covers the parts of the Project located onshore in the UK ('Onshore Components') and in the UK Marine area, defined as all of that part of the Project from the Mean High Water Spring Tide ('MHWS') in the UK out to the limit of the UK/France EEZ ('Marine Components'). Together the Onshore Components and the Marine Components comprise the 'Proposed Development', in respect of which the DCO Application is made.

1.1.1.3. This document sets out the Outline SRP that will be developed by the main works contractor and applied to all soil resources that are disturbed either permanently or temporarily for the Proposed Development.

1.1.1.4. A Scoping Opinion was received by the Applicant from the Planning Inspectorate (on behalf of the Secretary of State for Business, Energy and Industrial Strategy) on 7 December 2018. The Inspectorate commented that the Scoping Report refers to the intention to implement a Soil Resources Plan and that this plan should be appropriately secured. The Inspectorate recommended that an Outline Plan be provided with the DCO Application.

1.1.1.5. The purpose of a Soil Resource Plan is to:

- accurately record the existing soil resources within each Onshore Cable Route Section that are to be used temporarily in the construction of the Proposed Development. This will then be used to provide a specification for its restoration following the construction period; and
- identify the volume of each type of soil that will be available for re-use in the detailed design of the Proposed Development from land parcels that are affected by the permanent works and that will not be returned to agricultural use.

1.1.1.6. This Outline SRP sets out the requirements of the detailed SRP that will be developed by the Principal Contractor.

1.2. SOIL RESOURCE PLAN

1.2.1. CONTENT

A detailed SRP shall be produced and submitted to the relevant Local Planning Authority prior to the commencement of each phase of the Proposed Development in which the soil resource will be disturbed for either temporary or permanent works.

1.2.1.1. Within each Onshore Cable Route Section, the SRP shall identify:

- the texture of each soil horizon present;
- the depth of each soil horizon;
- the colour of each soil horizon by reference to the Munsell Soil Color Charts (Munsell Color, 2009);
- the stone content of each soil horizon;
- the pH, organic matter and major nutrients of the topsoil horizon;
- the pH, organic matter and major nutrients of the subsoil horizon (upper and lower, as present); and
- the Agricultural Land Classification ('ALC') grade.

1.2.1.2. Soil texture describes how the mineral element of soil comprises a mixture of mineral particles of different sizes, and a different texture class can be ascribed according to the proportions of sand, silt and clay. According to the BSI specifications for topsoil (British Standards Institution, 2015) and subsoil (British Standards Institution, 2013), the size ranges of these particles are:

- clay (<0.002mm);
- silt (0.002mm to 0.06mm);
- sand (0.06mm to 2.00mm) comprising:
  - fine sand (0.06mm to 0.2mm);
  - medium sand (0.2mm to 0.6mm); and
  - coarse sand (0.6mm to 2.0mm).

1.2.1.3. Physical soils data is available for the majority of the land within the Order Limits that will be disturbed. The Principal Contractor shall be responsible for identifying that the available data is adequate in scope and nature to meet the above requirements of a SRP. The Principal Contractor shall be responsible for collecting the data on organic matter content and major nutrients, and remedying any deficiencies identified in the spatial scope of the data on soil physical characteristics.

1.2.1.4. Where required, the data on the physical attributes (texture, depth and stone content) shall be collected at an observation density of one observation per hectare ('ha'). The data on organic matter content and major nutrients shall be collected at a density of one sample per 3ha or, if the land parcel is smaller than 3ha, one sample per land parcel.

1.2.1.5. The physical and nutrient data will be recorded on a GIS proforma (format to be agreed) to enable the Principal Contractor to identify the areas and volumes of different soil types within each land parcel.

1.2.2. SOIL HANDLING

1.2.2.1. As part of the SRP, the main works contractors shall prepare a Soil Handling Strategy for each phase of the Proposed Development where there is the potential for the significant disturbance of soil resource. There will be negligible disturbance of soils in Onshore Cable Route Sections 5, 8 and 10: a handling strategy is not required for these Sections.

1.2.2.2. Soils that are disturbed temporarily during the construction of the Proposed Development are associated with:

- site compounds and working areas;
- temporary haul roads;
- temporary roads; and
- topsoil and subsoil stockpiles.

1.2.2.3. All method statements will need to comply with the mitigation commitments made in Chapter 17 of the ES, namely:

- to ensure that topsoil and subsoil resources are kept separate and placed either side of the exposed cable route trenches;
- the void above within the cable ducts (within cement-bound sand) will be backfilled with the excavated soil; and
- full use will be made of the topsoil resource in the reinstatement of soils above the cable ducts: the surplus material will be subsoil.

1.2.2.4. For land parcels affected by temporary works, the Soil Handling Strategy shall set out detailed Method Statements for protecting the agricultural assets of the soil resource in each Onshore Cable Route Section during the construction period. This will be determined on a case-by-case basis and will depend on:

- the resilience of the existing topsoil and subsoil resources to the loads to be imposed by construction activities, which will depend on the depth, texture and structure of each soil horizon;

- the ability to restore land to its current condition following the removal of construction platforms and works.

1.2.2.5. For land parcels affected by temporary works, the detailed Method Statements shall identify (as relevant):

- the anticipated loads on the soils from construction activities;
- the methods to be used to return agricultural land to good agricultural condition following the removal of the construction platform;
- the area in each land parcel in which the topsoil and subsoil will be stripped and placed in store during the construction period;
- the working methods and plant to be used to strip topsoils and subsoils and place them in temporary stockpiles;
- the methods to be used to construct temporary soil stockpiles;
- the locations of temporary soil stockpiles;
- the methods to be used to maintain temporary stockpiles according to the length of time the soil is in storage; and
- the methods to be used to replace soils from the temporary stockpiles within each land parcel.

1.2.2.6. In all cases the Principal Contractor shall have regard to and comply with good practice guidance on stripping, handling and restoring soils.

1.2.2.7. Good practice guidance for stripping and handling topsoil and subsoil is contained in:

- BS 3882:2015, Annex A, A.1;
- BS 8601:2013, Clause 6, 6.1;
- Defra Construction Code of Practice for the Sustainable Use of Soils (Department of Environment, Food and Rural Affairs, 2009), sections 5.2 and 5.3; and
- MAFF Good Practice Guide for Handling Soils (MAFF, 2000), Sheet 1.

1.2.2.8. Good practice guidance on building topsoil and subsoil stockpiles, and maintaining soils in storage is contained in:

- BS 3882:2015, Annex A, A.2;
- BS 8601:2013, Clause 6, 6.2;
- Defra Construction Code of Practice for the Sustainable Use of Soils, section 5.4; and
- MAFF Good Practice Guide, Sheets 2 and 14.

1.2.2.9. Good practice guidance on excavating soils from stockpiles is contained in the MAFF Good Practice Guide, Sheet 3.

1.2.2.10. Good practice guidance on replacing topsoil and subsoil, including guidance on decompaction, is contained in:

- BS 3882:2015, Annex A, A.3 and A.4;
- BS 8601: 2013, Clause 6, 6.3, 6.4 and 6.5;
- Defra Construction Code of Practice for the Sustainable Use of Soils, section 6.1; and
- MAFF Good Practice Guide, Sheets 4, 15, 18 and 19.

1.2.2.11. The SRP will include provisions for topsoils and subsoils that are permanently displaced for the construction of the Proposed Development to be re-used within the Order Limits in reprofiling the landform and screening. Proposals will be set out for the most appropriate re-use of any surplus topsoil or subsoil. The topsoils and subsoils within the area of permanent works, in Section 1, are of moderate to poor quality and there is no requirement to import any topsoils or subsoils to the Proposed Development.

1.2.2.12. For land parcels affected by permanent works, the detailed Method Statements shall also identify:

- the working methods and plant to be used to strip topsoils and subsoils following the good practice guidance set out in paragraph 1.2.2.7;
- the volumes of soils that will be placed in temporary stockpiles or directly re-used within or outside the Order Limits;
- the locations of temporary stockpiles;
- the specification for each land use or design element within the Order Limits requiring topsoil and subsoil resources, in terms of soil texture, depth, organic matter content and nutrient status; and
- the working methods and plant to be used to place topsoils within the detailed design of the Proposed Development, following the good practice guidance set out in paragraph 1.2.2.10.

1.2.2.13. Where land is to be used temporarily and returned to the landowner, as will be required along the Onshore Cable Route in areas in which the cable will be laid in an excavated trench and subsequently backfilled, there shall be liaison with the relevant landowners on working methods and restoration. Site inspections shall be undertaken to monitor working practices and compliance of the contractors with their obligations to landowners and occupiers. Should remedial actions become necessary following soil reinstatement, these shall be undertaken as agreed prior to handover back to the landowner

REFERENCES

British Standards Institution. (2013). *BS 8601:2013 Specification for subsoil and requirements for use.*

British Standards Institution. (2015). *BS 3882:2015 Specification for Topsoil.*

Department of Environment, Food and Rural Affairs. (2009). *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.*

MAFF. (2000). *Good practice guide for handling soils.* Retrieved from https://webarchive.nationalarchives.gov.uk/20090306103114/http:/www.defra.gov.uk/farm/environment/land-use/soilguid/index.htm.

Munsell Color. (2009). *Munsell Soil Color Chartss.*